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Paper TRADE JOURNAL

VOLUME 127, NO. 19 NOVEMBER 4, 1948

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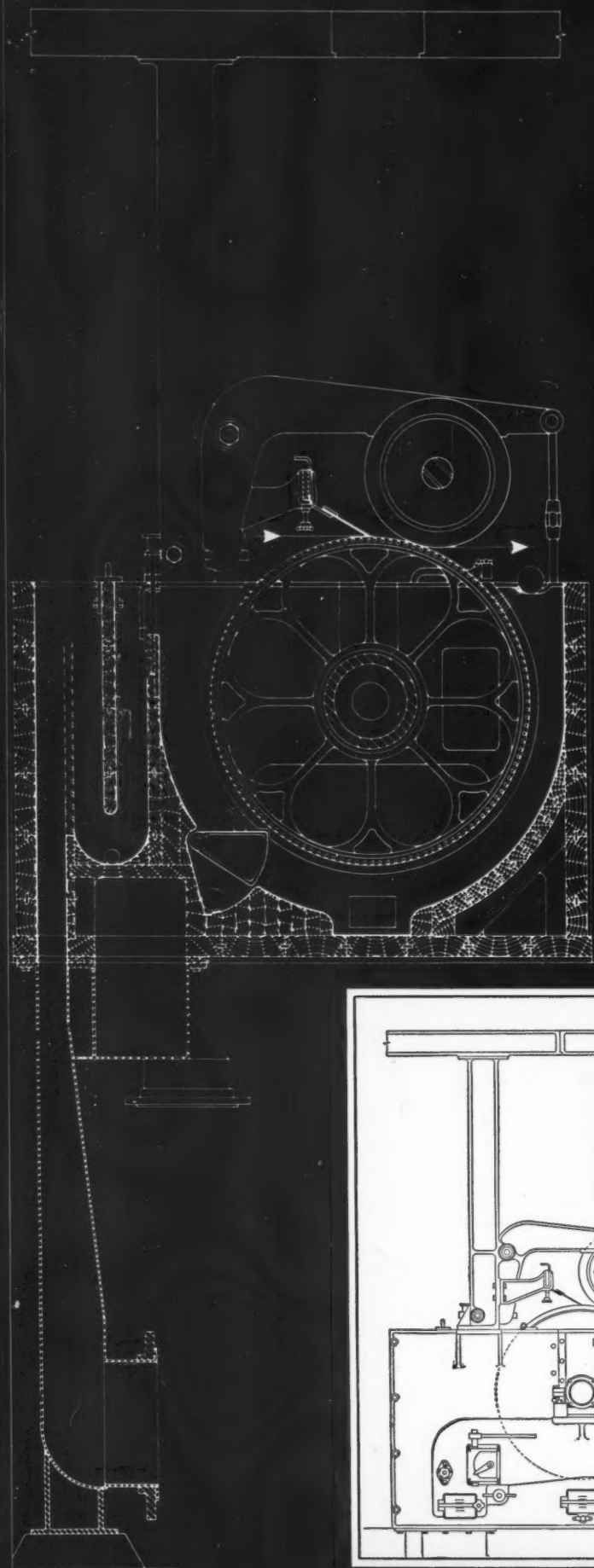

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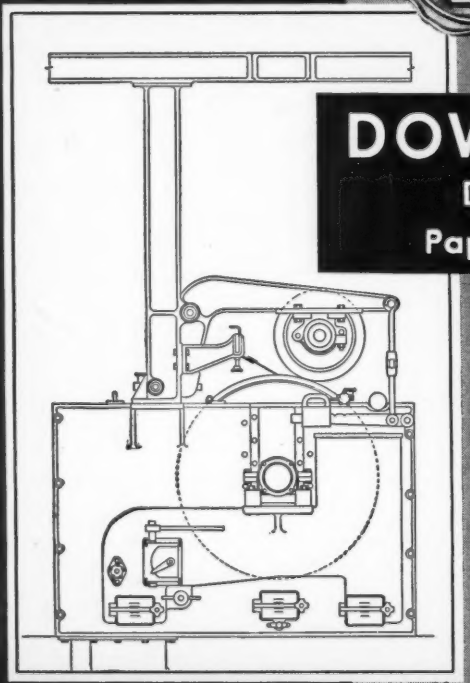

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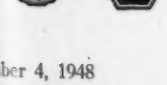

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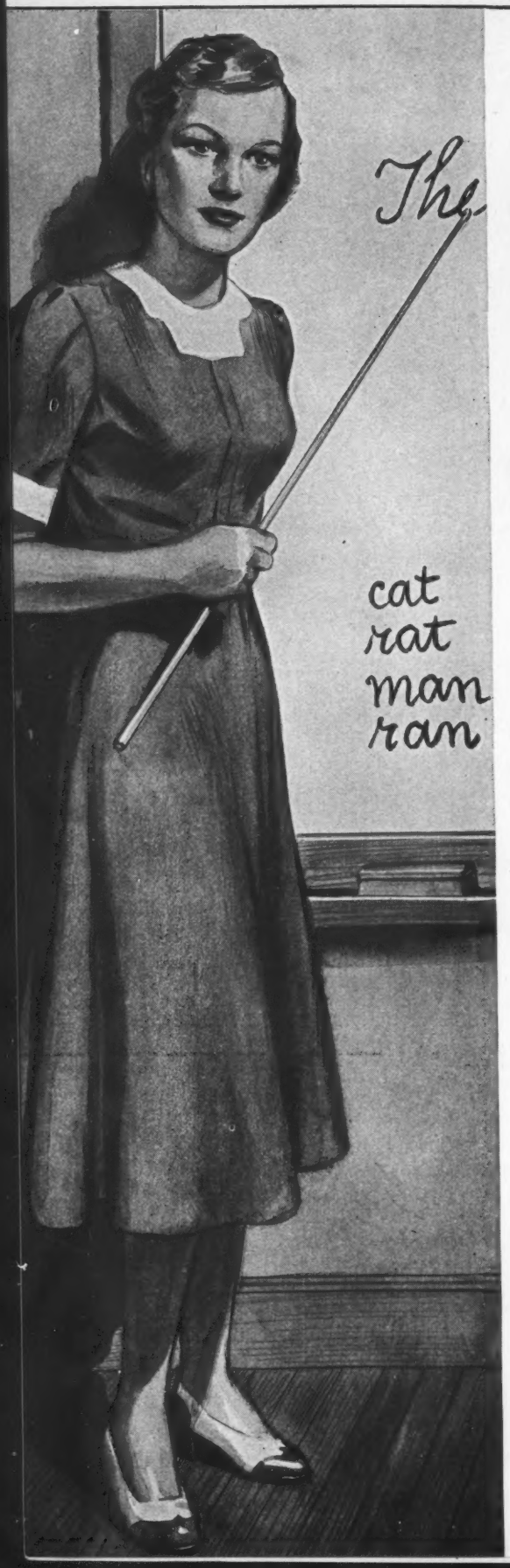

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NOV. 4, 1948

VOL. 127, NO. 19

TAPPI Third Engineering Conference

Draws 350 to Buffalo, N. Y., October 25-28

BUFFALO, N. Y.—Approximately 350 members and guests of TAPPI attended the Third Annual Engineering Conference at the Hotel Statler, October 25-28. The meeting was sponsored by the Westinghouse Mfg. Co., and one of the most important features included a day at the new Westinghouse plant at Buffalo.

October 25

The conference was opened on October 25 by J. W. Hemphill, chairman of the TAPPI Engineering Division, and W. F. Gillespie, president of TAPPI. First paper of the meeting, entitled "Relationship of Top Management and Engineering in the Field of Paper Manufacturing," was presented by A. N. Ball of the E. B. Eddy Co., Hull, P. Q.

The materials handling session was conducted by the chairman, George Wadleigh, consulting engineer. Two papers were presented.

The afternoon session covered the subject of Engineering Research and Machine Design, under the chairmanship of Philip H. Goldsmith of the Pusey & Jones Corp.

The banquet that evening was held in the ballroom of Hotel Statler. W. F. Gillespie, toastmaster, introduced several guests in addition to the principal speaker, Rob Roy Macleod, vice-president of the Buffalo-Niagara Electric Corp. A summary of Mr. Macleod's speech will appear in an early issue.

October 26

On October 26 the entire group was taken to the Westinghouse plant where the regular meetings were held in the auditorium. The Heat and Power Session was conducted by Chairman John Warner of the Robert Gair Co. and the Drying and Ventilating Session was under the direction of A. E. Montgomery of the J. Q. Ross Engineering Corp.

The group was welcomed for Westinghouse by L. R. Ludwig, manager of the Buffalo Division. Mr. Ludwig described how the new plant was operated by Curtis-Wright during the war for the production of aircraft engines. Westinghouse acquired the buildings from WAA after the war and moved its electric motor manufacturing, wire and copper fabrication and industrial control manufacturing from Pittsburgh to the Buffalo location. Six hundred key employes were transferred, in addition to the equipment and machinery. The plant now employs 7,000 persons and has a capacity of 35,000 motors per month in addition to the industrial controls, wire, etc.

A complete new line of motors called Lifeline is being manufactured in the new plant which has a total floor area of 2,400,000 square feet, making it the world's largest plant for building motors and controls.

An excellent luncheon was provided in the Westinghouse cafeteria, after which the visitors were formed into groups of eight and shown through the plant.

October 27

On the morning of October 27 the Drying and Ventilating Session was continued in the ballroom of the Statler under the direction of Mr. Montgomery.

The session on Mill Maintenance and Materials, conducted by Chairman George Pringle, consisted of three papers and concluded the morning session.

That afternoon was devoted to roundtable discussions as follows:

Drying and Ventilating — A. E. Montgomery, moderator. Subject: Discussion of Problems Submitted.

Mill Maintenance and Materials — Frank La Que, International Nickel Co., moderator. Subject: "Corrosion Problems Submitted."

Engineering Research and Machine Design—Philip H. Goldsmith, moderator. Subject: "Flow of Stock in Pipes."

Materials Handling — George R. Wadleigh, moderator. Subject: Discussion of Problems Submitted.

Steam and Power—J. E. A. Warner, moderator. Subject: "Fly Ash Disposal and Use." "Recent Developments in the Use of Fly Ash and Boiler Slag," was the topic presented by L. John Minnick of the G. & W. H. Corson, Inc., of Plymouth Meeting, Pa.

In the evening the Westinghouse Electric Corp. was host to the group at a get-together party followed by dinner in the main ballroom of the Statler. R. S. Kerch, manager of the firm's industrial sales department, was toastmaster and introduced A. C. Monteith, vice-president in charge of engineering, who gave a short talk describing the methods of obtaining and screening young engineering graduates for training as Westinghouse employes.

The group was then entertained by the "Theatre of Atoms," a spectacular demonstration which facilitates understanding of some of the principles of atomic fission.

October 28

In the morning of October 28, eighty members were taken by bus to the Lockport Felt Co. at Newfance, N.Y., and shown the intricacies of felt manufacture. The Lockport Felt Co. was then host to the group for refreshments and luncheon at the Lockport Country Club.

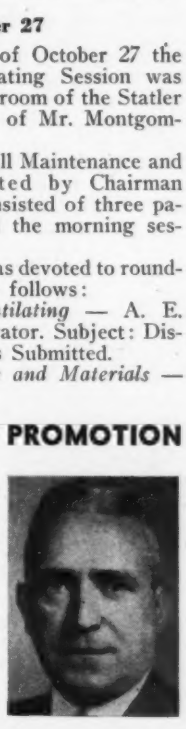
After lunch the group was taken to the Upson Co. and shown through the mill. Although the board mill is quite similar to many other mills making chipboard, the converting operations by which this material is made into wallboard are rather unusual. Picture puzzles and place mats are among the items produced at this mill.

Attending the conference were:

Aeschbacher, Siegfried N., Utzonsturf Paper Mill; Agronin, Tany, Shartle Bros. Mach. Co.;

(Continued on page 14)

MATHIESON PROMOTION



Harry P. Smith, formerly New York district sales manager of the Mathieson Chemical Corp., has been made assistant general manager of sales. His headquarters will remain in New York.

Aguasabon Power Plant Officially Opened

TORONTO—Another milestone in the development of northwestern Ontario was passed on October 19 when Robert Saunders, chairman of the Hydro-Electric Power Commission of Ontario, officially opened the Aguasabon generating station which is to supply electrical energy to the new $23,000,000 pulp mill of the Long Lac Pulp & Paper Co., at Terrace Bay, expected to go into operation on November 15.

The new $12,500,000 generating plant, 130 miles east of Port Arthur, can produce nearly a million kilowatt hours a day. The new plant at Terrace Bay has contracted for 300,000 kw per day and Aguasabon will help supply the new Brompton plant at Red Rock, which started production in 1945. Marathon, 40 miles east of Terrace Bay generates its own power, but Mr. Saunders revealed that two other new pulp mills may be erected west of Fort William, at Atikokan and either Sioux Lookout or Hudson. Another new generating plant on the Nipigon River will be completed in 1951 and will be capable of producing nearly 1,500,000 kw a day.

"With these plants and another one proposed at Boundary Falls near the Manitoba border, which will generate over 3,500,000 kw a day, this northwest part of the province will have energy to spare," Mr. Saunders said. He added that, "Because of these, we already have applications from new industries which propose establishing in the north."

Mr. Saunders stated that the commission proposes to link its Thunder Bay system with northeastern Ontario and ultimately southern Ontario, so that any possible surplus in any of the three sections of the province can be transferred as needed.

The Hydro commissioner also said that hydro plants at Ear Falls and Rat Rapids north of Sioux Lookout, now are piped into the Thunder Bay. Work on the Rat Rapids development will continue next year.

All these developments are part of a $320,000,000, five-year hydro expansion program which will boost capacity of the commission's own plants by 60 percent, or roughly by 1,000,000 horsepower. The current capacity of the commission's generating plants is about 1,700,000 horsepower.

Aguasabon is the kingpin of $90,000,000 of new construction along Lake Superior's north shore, which in less than five years has more than doubled the population between Sudbury and Port Arthur.

Among the engineering feats at Aguasabon was a 3,500-foot-long tunnel groundhogged out of solid rock. It carries the water from the newly created Hayes Lake to the generating station on the shores of Lake Superior. The drop from the higher level to Superior is 270 feet or 110 feet more than the drop at Niagara Falls. The tunnel cost about $2,000,000 and was completed in exactly nine months. Equipment from northern Ontario mines advanced one foot an hour, 24 hours a day. The flow of the Aguasabon River had to be tremendously increased to make this power development possible. Its normal flow would have generated less than 15,000 kw, but by diversion of the waters of Long Lac, which normally flowed north into James Bay via the Albany River the present capacity of around 1,000,000 kw a day was made possible.

Southern Ontario is presently experiencing a serious shortage of electrical energy, a situation which has been increasingly bothersome to manufacturers during the last three years. Many plants have shifted their working hours to avoid a complete shutdown. Many work on Saturdays and Sundays, while others have inaugurated night shifts. The unprecedented expansion of Canadian industry, especially in Ontario, since the recent war, is the chief cause of the shortage, although an exceptionally long dry spell during August and September had no small effect on the sources of hydro-generated power. A new generating plant at Des Joachims on the Ottawa River will not be completed for another two or three years. In the meantime lighting is being cut off from stores and residences for a period of an hour each morning before noon with the prospect of a second hour-long cut each day if the situation does not improve. There are few pulp and paper mills in the affected areas but paper converters are being hampered in the same way as other industries by having to shift their working hours.

Canada Speculating About ECA

OTTAWA — Appearance during the week ending October 30 of the first ECA authorization for newsprint has led to speculation as to how far ECA funds are likely to be available to underwrite exports of this item to the United Kingdom or Europe in the future.

The facts are: (1) The initial ECA appropriation of $4,000,000 covers earlier authorization totaling 40,000 long tons. This represents roughly half-a-year's commitment for newsprint exports, so far as they are likely to be underwritten by use of ECA funds. (2) Expected newsprint shipments from Canada and Newfoundland to the United Kingdom in 1949, are to be 80,000 long tons on a firm basis. In addition, there is an option for purchase of an additional 20,000 long tons if the United Kingdom can find sufficient dollars to finance this purchase.

Press despatches from Washington, commenting on the initial ECA newsprint grant, refer to evidence by Paul Hoffman before the Senate appropriations committee last May. He was quoted as saying he saw "no reason why Europe should look to Canada for its newsprint." He is quoted as saying that Europe should utilize idle paper-making machinery, plentiful pulpwood and available skilled labor to supply its own needs.

At that time, the initial ERP estimates as contained in the famous "brown books," had just made their appearance. Through a clerical error, a figure of approximately 288,000 tons of newsprint had been used to indicate the amount of Marshall Aid which would be needed for European needs.

Since then, two things have happened. First, the British have slashed by more than half, their contractual obligation to buy 220,000 tons of newsprint from Canada and Newfoundland. Total purchases in the present year are not expected to exceed 100,000 tons.

And as already indicated, the plan for 1949 is to take 80,000 tons certain, plus a further 20,000 tons if the dollars are available.

Just here, it is important to note that the British had earlier threatened to cut back their newsprint purchases to 40,000 tons in 1949. It has now apparently been established that this further cut will not be made, and that the 80,000 tons—plus—option is the 1949 basis.

Behind this proposed program and the availability of some ECA funds, is a belief on the part of Paul Hoffman and other ECA officials that one of the keys to better understanding for ECA and the U.S. aid program in Europe, is more publicity. One way to ensure greater publicity is to see that a reasonable supply of newsprint is made available. Presumably it is on this basis that ECA officials will justify use of a moderate amount of ECA funds for the purchase of this item in Canada and Newfoundland.

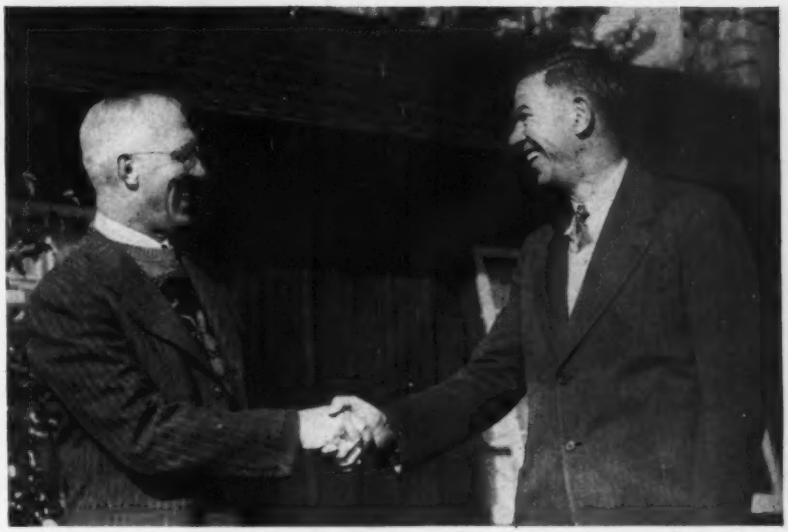
Canadian Imports Drop

OTTAWA—Canadian imports of paper dropped to $1,284,000 during August this year compared with $1,732,000 during the same month last year and declined to a total of $11,588,000 in the January-August period this year as against $15,443,000 in the corresponding period a year ago, the External Trade Branch of the Canadian Government reports.

Lake States Forest Industries Information Committees Meeting

Eagle River, Wisconsin, October 14-15

EAGLE RIVER, Wis.—About 40 members and guests of the three Lake States Forest Industries Information Committees met in joint session at the Trees For Tomorrow camp here on October 14-15. This camp, sponsored by a group of Wisconsin River paper mills, is maintained as an educational and demonstration facility which has catered to a wide cross section of forest interest including 4-H clubs, Federated Womens clubs, newspaper editors, college students and miscellaneous conservation groups.



F. G. Kilp of the Nekoosa-Edwards Paper Co., (left) newly elected chairman of the Wisconsin Committee; Stanton Mead of the Consolidated Water Power & Paper Co., retiring chairman.

Keynote

Stanton Mead of the Consolidated Water Power & Paper Co., chairman of the Wisconsin committee, keynoted the meeting with a statement that there had arrived a maturity of thought with respect to industrial forestry which had superseded the former "cut-out, get-out" philosophy. He said the growing feeling of industrial permanence was not confined to the paper industry but was reflected in the sawmills as well. Referring to a recent speech describing 20 years of Wisconsin forestry by D. C. Everest, president and general manager of the Marathon Corp., Mr. Mead said the Lake States region was fortunate in having such a vast acreage of land appropriate for and now being converted to the purpose of industrial and public forestry.

John B. McAfee, secretary, New York City, said that only five out of 591 members of Congress were from the forest industries, citing this fact as logic for the enlightenment of Congressmen with respect to the nation's fourth largest industry.

Michigan

Franics Kiefer of the Port Huron Pulp & Paper Co., vice-chairman, told of the recently instituted Tree Farm project sponsored by the Michigan committee. W. F. Ramsdell, secretary, said that current leadership has inspired a resurgence of belief in the possibilities of forest production. Abbott M. Fox, chairman, characterized the needs of the forest industries as being sufficiently extensive to put all unused forest acreage to work.

Minnesota

Ted Willits of the M & O Paper Co., related legislative accomplishments, particularly the Nursery Law and the coordination of assessing procedure. John Hoene, secretary, described the committee's State-wide public relations effort intended to familiarize the public with the importance of Minnesota's industries.

Wisconsin's Forests

Harold S. Crosby, secretary of the Wisconsin committee, said that approved Industrial Forests now approached the half-million acre mark with applications pending on some 40,000 acres.

F. G. Wilson of the Wisconsin Conservation Department observed that many of the reforms necessary to successful industrial forestry in other States had already been corrected by legislation in Wisconsin. He told of the .2 mill tax for forestry purposes and said the Conservation Commission could adopt its own budget.

Lake States Resources

R. N. Cunningham, Lake States Forest Experiment Station, said that while forest growth was now approaching forest drain there is too much young timber and too little mature timber in the Lake States and the area is falling far short of meeting its lumber needs. There is overcutting in spruce pulpwood, whereas aspen growth would support more extensive cutting.

Two films, "Green Frontiers" and "Paper, Mister" followed a discussion on Mr. Cunningham's talk and the meeting closed the next day with field trips to plantations of the State of Wisconsin and the Consolidated Water Power and Paper Company.

Election of Officers

F. G. Kilp of the Nekoosa-Edwards Paper Co., was elected chairman of the Wisconsin Committee succeeding Stanton Mead; G. A. Houghton of Goodman, was elected vice-chairman; O. T. Swan of Oshkosh, treasurer and H. S. Crosby, secretary.

British Capital Migrating

OTTAWA—The Canadian Government reports that opening of branch plants in Canada by British firms is now reaching "major proportions", and, when financial arrangements are completed, some of the largest British companies, including one fine paper producer, will commence operations on Canadian soil within the next several months.

Money, it is said here, for starting these businesses in Canada is being obtained from the disposal of British-owned Canadian securities in the United Kingdom under terms of the Canadian loan to Britain of 1942 and as funds become available from such gradual sales of securities, British authorities allow the export of such dollars for establishing branch plants in Canada.

Shipping Costs on Paper and Paper Articles

By EDWIN CHESTER HASTINGS
Edwin Chester Hastings Traffic Service, Pittsburgh, Pa.

Shipping costs on paper and paper articles have been *temporarily* saved from another added expense that would raise the sales price, the Interstate Commerce Commission having denied the plea of the Eastern rail lines to increase rates on small shipments.

The rail petition covered less-than-carloads (any shipment over 100 pounds) between points in Official Territory and Eastern Canada.

The area is one of the most densely populated industrial districts in the United States. It covers the following states: part of Eastern Wisconsin, Illinois, Indiana, lower half of Michigan, Ohio, West Virginia, two-thirds of Virginia, Delaware, Pennsylvania, New Jersey, New York and all New England states. Most all lcl shipments have a high rating and due to this present factor the ICC held the proposed increases were not reasonable.

Rail complaints and the plea for an increase are based on lack of revenue even though there is an admission of heavy tonnage. The 'heavy tonnage' is on low rated commodities where there is less expense in movements. On lcl shipments, the heavy volume overshadows 'tonnage' in the matter of expense to the carriers. Rates are set-up on the platform of a happy medium, an "in-between," that is, each rate is to bear a share of the cost of all transportation. A carrier only sells one item and that is transportation, if there isn't anything to haul then the means is useless. To attract traffic, the rate must not be too high nor too low. If too high then traffic will slow to a standstill and if too low the carrier loses money on the deal and will go out of business.

Lcl shipments as a source of revenue to the carrier is big business, but to do the handling of many separate shipments several times in transit, such as transfer at terminals, there is more expense than on large shipments. This results in high ratings and the plea to increase rates above a reasonable level. Most of these shipments travel on Class-1 ratings (100 percent rates) and Class-2 ratings (85 percent rates).

A check of one major carrier, the Pennsylvania Railroad, disclosed that of all lcl revenue received, 52 percent was obtained from articles rated 2nd Class and higher (85-100 percent). From 3rd Class (70 percent), the revenue is 67 percent.

If one considers the paper tonnage that moves lcl and contrasts the total with carloads it will supply the answer why freight charges are exceedingly higher than they should be.

It is well known that the area where the rail carriers hoped to place this new increase handles more traffic than any other part of the country. The effect would have been felt in a larger area than previously cited, as for example a paper plant in Iowa or Georgia shipped various lcl orders to Cleveland, Chicago, Philadelphia or Boston. Those plants located outside the area are obligated to pay more due to their shipping *into* the area. The rule that governs shipments as far as the rate is concerned, the destination and not the origin point covers the application. It is where a shipment moves *to* that rules. The cities mentioned are within the area slated for the proposed increases and they are governed by both Official Classification ratings and Official Territory class rates.

The increase, if it had been granted, would have given the rail carriers $26,000,000 additional yearly. Of this amount the PRR, over whose lines more lcl traffic travels than others, would have received over $10,000,000.

The increases were figured above the present rates on this basis: 95-110 percent on 5 miles; 70-84 percent on 25 miles; 10 percent on 600 miles; 2 percent on 700 miles and longer distances.

New York Q. M. Opens Tissue Bids

NEW YORK — Bids from the 20 concerns, out of 101 solicited, accepting invitation QM-30-280-49-452 of September 10 for eleven million rolls of toilet tissue were opened by the New York Quartermaster Purchasing Office, 111 East Sixteenth street, on October 22. Award had not been made at time of going to press. Item calls for 1,000 sheet rolls, crushed or uncrushed, 4½ x 4½ or 4½ x 5, to meet Fed. Spec. UU-P-556b of October 25, 1937, and amended September 1, 1943. Quantities desired were 1,000,000 for Atlanta, 1,000,000 Columbus, 400,000 Richmond, 1,000,000 San Antonio, 2,000,000 Schenectady, 600,000 Utah, 3,000,000 Lyoth, 2,000,000 Auburn. Summaries of bids follow:

Acme Paper Co., San Francisco.
Price .00927, terms net, acceptance 21 days, destination Lyoth, f.o.b. San Francsico.

Barclay Paper Co., Fulton, N. Y.
Price .0795, terms net, acceptance 60 days, destination as specified, f.o.b. Fulton.

Berwin Paper Co., Parkinsville, N. Y.
Price .0865, terms 1/30, acceptance 20 days, destination Schenectady, f.o.b. Schenectady.

Consolidated Paper Co., Los Angeles.
Price .09, terms 1/30, acceptance 20 days, destination Utah and Lyoth, f.o.b. Los Angeles.

Crown Zellerbach Corp., San Francisco.
Price* .0753, terms net, acceptance 30 days, destination Auburn, f.o.b. destination.
* unbleached, 96 rolls in case.

Erving Paper Mills, Erving, Mass.
Price .069, terms 1½% 20, acceptance 20 days, destination all named, f.o.b. Orange, Mass.

Ashland Paper Mills, New York City.
Price .070516, .072252, .07326, .078076, .0792, 080036, acceptance 30 days, destinations named, f.o.b. destination.

Haas Bros., San Francisco.
Price .0927, terms net, acceptance 60 days, destination Lyoth, f.o.b. destination.

International Cellucotton Co., Chicago.
Price* .1123, terms net, acceptance 60 days, destination all, f.o.b. destination.
* Delsey facial, 4½x5, 850 single, 425 double.

Leonard Tissue Co., Cambridge, Mass.
Price .0736, .0753, .0765, .0795, .08, .0825, .083, terms 1% 30, acceptance 60 days, destination all, f.o.b. destination.

Morgan Paper Co., Lititz, Pa.
Price* .0792/.084, terms 2% 30, acceptance 30 days, destination all, f.o.b. Lititz, Pa.
* .0792 4½x42, .084 4½x5.

National Paper Co. of Pa., Ransom, Pa.
Price .0685, terms 1% 30, acceptance 60 days, destination southern points, f.o.b. Ransom.

Resolute Paper Co., Windsor Locks, Conn.
Price .0724/.0774, terms ½% 20 days, acceptance 21 days, destinations all, f.o.b. Windsor locks.

Park Tissue Mills, New York City.
Price* .07, .07408, .075129, .07587, .07933, terms 2% 30, acceptance 20 days, destination all, f.o.b. desination.
* according to destination.

Peerless Paper Co., Oaks, Pa.
Price .086, terms 1% 10, acceptance 60 days, destination Schenectady, f.o.b. Montgomery County, Pa.

Spruce Rivers Paper Co., Lyons, N. Y.
Price .0735, terms 1% 20, acceptance 60 days, destination all, f.o.b. Lyons.

Raycarr Co., Salem, N. Y.
Price .0735, terms 1% 20, 20 days acceptance, destination all, f.o.b. Albany & Salem, N. Y.

Sylvan G. Ungerleider Co., San Antonio, Tex.
Price .07999, terms 1% 10, 60 days acceptance, destination all, f.o.b. cars.

Wexler Paper Co., Minneapolis, Minn.
Price .0956, terms 2% 10, 1% 20, 20 days acceptance, destination Columbus, f.o.b. destination.

Ginsburg Paper Co., Somerville, Mass.
Price .08, terms 2% 20, 20 days acceptance, destination all, f.o.b. E. Paterson, N. J.

Navy Award Made

NEW YORK—A contract was awarded on October 29 by the Navy Purchasing Office, 111 East Sixteenth street, to the Gibraltar Corrugated Paper Co., North Bergen, N. J., for 75,000 fireboard containers as specified in Invitation No. 3511. The total price was $4,706.25.

New York QM Invites Bids

NEW YORK—Invitations to bid have been issued by the New York Quartermaster Purchasing Office, 111 East

United States Imports and Exports

Pulpwood, Wood Pulp, Paper, Paperboard and Paper Products

July, August and First Eight Months of 1948—Preliminary Figures

(In short tons except where otherwise indicated)

IMPORTS

Item	August 1948	August 1947	July 1948	First 8 months 1948	First 8 months 1947
Pulpwood, total (in cords of 128 cu. ft.)	211,473	221,456	256,980	1,394,723	1,184,976
Rough	115,495	133,324	144,839	641,993	626,710
Peeled	87,674	80,929	102,463	690,147	505,582
Rossed	54	101	128	682	243
Chipped	8,250	7,102	9,550	61,901	52,441
Wood Pulp, total	179,342	275,187	183,646	1,564,722	1,523,683
Bleached, sulphite, rayon and special chemical grades	23,571	23,411	19,240	164,874	159,208
Bleached sulphite, other	22,999	29,687	29,842	214,476	189,989
Unbleached sulphite	55,711	83,993	59,706	498,585	502,283
Bleached sulphate	23,669	28,527	27,214	196,273	149,573
Unbleached sulphate	27,159	75,965	26,007	263,631	309,575
Soda pulp	2,255	1,804	2,000	16,523	13,042
Chemical screenings	288	879	521	6,182	6,254
Bleached mechanical groundwood	.....	.....	.....	.....	.....
Unbleached mechanical groundwood	23,264	30,589	21,795	201,214	190,621
Mechanical groundwood screenings	426	332	321	2,964	3,138
Waste Fibrous materials, total	7,886	4,253	8,925	67,903	45,183
Rags for paper stock	1,394	308	1,568	15,805	8,147
Other pulp, rag, straw, esparto, etc.	.....	.....	.....	.....	31
Other waste fibrous materials	6,492	3,945	7,357	52,098	37,005
Paper, paperboard and paper products, total	405,913	328,723	377,031	2,985,404	2,652,010
Paper and paperboard, total	405,498	328,434	376,542	2,981,288	2,648,682
Paper, total	399,464	323,268	370,242	2,929,606	2,609,279
Newsprint	389,729	315,932	362,174	2,857,560	2,539,453
Printing, and book paper, uncoated	7,940	4,825	6,994	54,777	52,564
Fine paper, total	42	20	40	432	558
Writing paper	9	4	6	80	58
Cover paper	.....	.....	(1)	1	.....
Bristols	1	(1)	(1)	5	2
Thin paper	28	13	27	313	438
Other fine paper	4	3	7	33	60
Wrapping, bag, and converting paper, total	1,722	2,354	989	15,288	15,422
Greaseproof	(1)	(1)	11	29	51
Vegetable parchment	1	1	(1)	12	5
Kraft wrapping	1,226	1,084	734	8,203	5,876
Wrapping, except kraft	495	1,269	244	7,044	9,490
Tissue and crepe paper	(1)	120	40	1,235	799
Absorbent paper	1	(1)	2	48	39
Building paper	30	17	3	266	444
Paperboard, total	6,034	5,166	6,300	51,682	39,403
Kraft container board	.....	.....	.....	604	.....
Other container and boxboard	.....	80	.....	25	2,740
Other paperboard	4,028	1,780	3,662	29,855	14,320
Fiber insulation board	.....	615	167	187	1,069
Wallboard	2,006	2,691	2,471	21,011	21,274
Paper products	415	289	487	4,116	3,328

EXPORTS

Item	August 1948	August 1947	July 1948	First 8 months 1948	First 8 months 1947
Pulpwood (in cords of 128 cu. ft.)	.....	4,833	27,703	33,037	62,702
Wood pulp, total	7,553	13,358	9,606	70,870	83,791
Bleached sulphite, rayon and special chemical grades	1,351	880	2,666	11,821	7,381
Bleached sulphite, other	696	5,646	490	13,815	29,057
Unbleached sulphite	4,760	3,938	5,349	38,172	37,728
Bleached sulphate	.....	399	.....	626	1,932
Unbleached sulphate	703	2,478	1,058	5,084	5,245
Soda pulp	.....	.....	.....	534	569
Screenings and other wood pulp	43	17	43	818	1,879
Waste fibrous materials, total	11,649	13,270	14,561	108,813	117,739
Overissue news	3,659	1,788	2,509	16,835	26,818
Other waste paper	6,380	10,119	10,004	78,920	80,095
Rags for paper stock; valued at $50 or over per ton	213	371	176	2,445	2,601
Rags for paper stock; valued under $50 per ton	760	866	1,151	6,471	5,387
Other paper stock	637	126	721	4,142	2,832
Paper, paperboard and paper products, total	37,098	49,091	34,899	273,237	308,636
Paper and paperboard, total	27,925	39,354	25,620	201,778	227,998
Paper, total	13,712	21,222	12,996	114,489	141,302
Newsprint	2,179	4,764	3,492	19,285	18,483
Book paper, uncoated	4,680	4,523	3,531	33,140	34,767
Fine paper, total	3,261	5,315	2,922	31,360	46,226
Writing paper	2,226	3,513	1,889	19,896	31,874
Cover paper	82	249	52	769	2,277
Bristols	323	567	437	4,105	4,027
Cigarette paper	630	986	544	6,590	8,048
Wrapping, bag, and converting paper, total	2,245	4,755	2,078	20,038	27,581
Greaseproof and waterproof paper	564	1,280	566	6,348	9,552
Wrapping, except kraft	701	1,709	693	6,774	10,752
Kraft wrapping	980	1,766	819	6,916	7,277
Tissue and crepe paper	476	408	374	3,557	5,288
Blotting paper	173	358	166	1,811	2,997
Sheathing and building paper	698	1,099	433	5,307	5,960
Paperboard, total	14,213	18,132	12,624	87,280	86,696
Kraft container board	8,463	8,862	5,387	35,419	29,773
Other container and boxboard	1,078	1,486	508	5,434	7,587
Other paperboard	1,664	3,533	3,857	20,986	22,757
Fiber insulation board	1,591	2,796	1,292	13,179	18,189
Wallboard	1,417	1,455	1,580	12,262	8,390
Paper products, total	9,173	9,737	9,279	71,459	80,638
Surface-coated paper	563	1,648	931	9,432	14,223
Toilet paper	525	570	609	4,880	5,279
Paper towels and napkins	172	159	203	1,413	1,408
Filing folders, index cards, and other office forms	93	118	219	1,287	1,082
Papeteries	2	12	7	47	348
Wallpaper	5	33	4	76	518
Shipping sacks	3,569	2,335	2,921	15,915	12,498
Paper bags	638	912	561	4,519	7,401
Shipping containers	333	460	586	6,393	5,971
Boxes and cartons	675	526	413	3,648	4,875
Envelopes	73	89	66	632	886
Cash-register and adding-machine tape	207	145	444	2,766	2,681
Other paper and products	2,318	2,730	2,315	20,451	23,468

[1] Less than one-half ton.

Note: Figures are preliminary; subject to revision.

Source: Prepared in the Forest Products Branch, Office of International Trade. Data from the Bureau of the Census, United States Department of Commerce.

Sixteenth street, on the following items:

QM-30-280-49-411: *Tape*, cellulose, transparent, 1" x 72 yd, also various other sizes types of tape—38,000 rolls. Bids will be opened 22 November 1948 at 2:00 P. M. (EST) at the New York office. Delivery—June 1949, for the U. S. Army.

QM - 30 - 280 - 49 - 433: Label Paper, Blank gummed oblong, white, w/red border—56,600 boxes. Bids will be opened 23 No. 1948, at 2:00 P.M. (EST) at the New York office. Delivery—May, 1949.

The above procurements are for the U. S. Army.

Government Aid for Water Treatment Plants

WASHINGTON — Procedures for obtaining financial assistance for planning and constructing treatment works under the National Water Pollution Control Program are being drafted by the U. S. Public Health Service and the Federal Works Agency, Major General Philip B. Fleming, F.W.A. Administrator, and Oscar Ewing, Administrator of the Federal Security Agency, disclose.

None of the money for grants for planning or loans for construction authorized under the Act has yet been appropriated, it was pointed out. The respective agencies concerned will ask Congress for the money to carry out provisions of the new law "at the earliest opportunity," said the officials.

"It is a long-range plan and immediate results will not be sensational," they reported, "but over a period of years the improvement in health, in recreational facilities and in the general public welfare will be immeasurable."

Terming the program "a challenge to States, municipalities, communities and industries," the officials said:

"The passage of Public Law 845 has provided for the first time a national program for the elimination of water pollution."

Other parts of their joint statement follow:

According to the law, States, municipalities, or interstate agencies must obtain approval of proposed projects from the appropriate State water pollution agency or agencies, and from the Public Health Service.

The Federal Works Administrator is authorized to make grants to States, municipalities, and interstate agencies for studies, surveys, and other action preliminary to construction, and to make loans at 2% interest for the planning and construction of sewage treatment facilities.

Grants for plan preparation of any one project cannot exceed $20,000, or one-third of the cost of such work, whichever is the smaller. The Act authorizes an appropriation not to exceed $1,000,000 annually for five years for the making of grants for plan preparation. Loans for any one project cannot exceed $250,000, or one-third of the cost of planning and constructing the project, whichever is the smaller. The Act authorizes an appropriation not to exceed $22,500,000 a year for five years for the making of loans for planning and construction.

It is specifically provided in the Act that the security of the loans, including the payment of principal and interest thereof, may be subordinated by the Federal Works Administrator to other obligations issued or to be issued for the project and to other obligations then outstanding.

The law authorizes the appropriation of $1,000,000 a year for the next five years to the Federal Security Agency to make grants for industrial wastes research and investigation. The money is to be allotted equitably and paid to the States for expenditure by or under the direction of their respective State water pollution control agencies, and to interstate agencies for expenditures by them, for the "conduct of investigations, research, surveys, and studies related to the prevention and control of water pollution caused by industrial wastes."

The Act establishes in the Public Health Service a Water Pollution Control Advisory Board. This board is to review the policies and program of the Public Health Service as undertaken under authority of this Act and to make recommendations to the Surgeon General. The Surgeon General or a sanitary engineer officer designated by him is to be chairman of this Board. The members of the board are to include one representative each of the Department of the Army, the Department of Agriculture, Department of the Interior, and the Federal Works Agency.

The remaining six persons are to be appointed by the President and are not to be officers or employees of the Federal Government. One shall be an engineer expert in sewage and industrial waste disposal, one shall be a person who shall have shown an active interest in the field of wildlife conservation, and, unless the President determines otherwise, one shall be a representative of municipal government, one a representative of State government, and one a representative of the affected industry.

The Surgeon General will organize water pollution control activities on the basis of major river basins. Fourteen river basin offices will implement the program in their respective watersheds. Headquarters will be in the Water Pollution Control Division of the Public Health Service.

The basin offices will be the operating centers and will cooperate with State and interstate agencies, the municipalities, and industry. Technical personnel at these offices will have the support of the research and technical service facilities of the Public Health Service Laboratory in Cincinnati. The Act provides for authorizations of $800,000 a year for the next five fiscal years for the construction of facilities for investigations and studies, and for the training of control personnel.

In the administration of the Federal Works Agency's responsibility, the functions of the Bureau of Community Facilities will be centered in the nine Division Offices of the Bureau.

The Federal Works Administrator will approve all grants made by the Bureau of Community Facilities for the plan preparation of projects, including studies, surveys, and other action preliminary to and concerned with construction. In many cases grants will be made to determine the feasibility of projects before detailed planning begins. All projects for participation in the program must be approved by the Surgeon General. Sequence of projects on which loans are to be made will be established by the Surgeon General.

The Federal Works Administrator will obtain sums from time to time from the Federal Security Administrator in order to make loans for planning and construction. The Bureau of Community Facilities will see that plans, specifications, and details relative to construction conform to each project as approved by the Surgeon General.

* * *

NORTH ADAMS, Mass.—Paper manufacturers here have been informed that Northern Berkshire communities that have been under pressure from the state department of public health to clean rivers and streams of pollution soon may be able to get federal funds to aid them in the work, provided Congress passes an appropriation.

The State Department of Health has filed a bill at the State House which would enable Massachusetts cities and towns to accept federal funds for water pollution abatement programs. Congress last July authorized control of pollution in the nation's streams, but neglected to appropriate money for the program then.

Until such time as the money is available, the Federal Works Agency charged with carrying out the work will not accept applications for loans.

Old Mill to Close

GEORGETOWN, Ontario — The Barber paper mills on the Credit River, built in 1854, and now the property of Provincial Paper, Ltd., are to be closed on November 15 because newer and bigber machines in others of the company's plants make paper faster and cheaper. About 80 employes are to be transferred, pensioned, or assisted to find other jobs.

The Barber mills grew from the combined ambition of four brothers, William, James, Joseph and Robert Barber, who came from County Antrim to Canada in 1822. They settled originally at Crooke's Hollow where in 1826 James Crooke erected the first paper mill in Canada. James Barber went into paper milling under Mr. Crooke's guidance and the local paper mill was begun in 1854. In 1912, the mills passed into the hands of Provincial Paper, Ltd.

Osborne Buys Kenmore

FULTON, N. Y.—Mark Osborne, president of the Osborne Paper Mill Equipment Corp., reports purchase of the Kenmore Mills of the Jessup & Moore Paper Co., Providence, Md., on October 28.

The purchase consists of a four-machine paper mill (Two 96" wide, one 110", and one 86", with a capacity of 115,000 pounds daily) complete with auxiliaries, including four 400 H.P. watertube boilers, steam engines, generators, water rights etc.

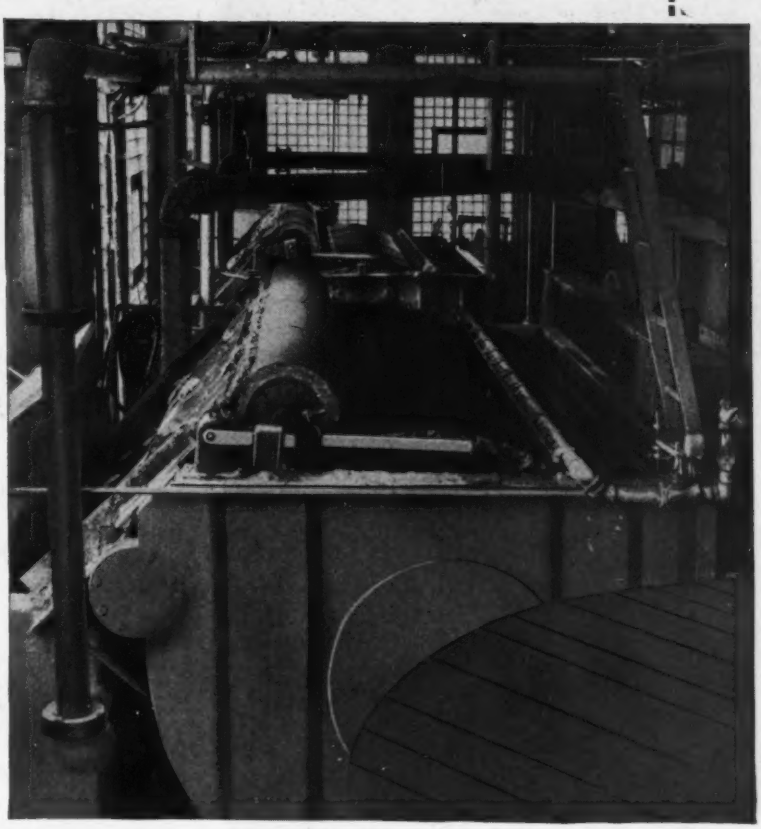
The mill is housed in a building having 80,000 square feet of floor space, on 70 acres of land, with two railroad sidings on the B. & O. Railroads. It is located on Elk Creek, 12 miles south of Wilmington, Del., and employed 270 people until September 26 of this year.

Paterson Sues Union

PHILADELPHIA—A $227,000 suit, believed to be the first in this area under the Taft-Hartley Act provision granting an employer the right to sue a labor union, has been filed by the Paterson Parchment Paper Co., Bristol, Pa., which on October 26 charged in U. S. District Court that the International Brotherhood of Paper Makers and its Local 500 caused an illegal strike at the company plant last Aug. 20. The company contends the plant has been and still is closed with a daily loss of $3,500. The suit seeks an additional $3,500 for each day as long as the strike continues. The strike is illegal, the company said, because a contract with the union was still in force at the time the strike was called.

WITH A SET-UP LIKE THIS.....

Costly Fibres Don't Get Away



Now is the time to keep your fences mended against fibre loss.

A well-planned Bird Save-All system pays for itself quicker than ever under today's conditions.

It handles all the waste water leaving the machine (the installation pictured handles 1500 gallons per minute) and returns the fibres at lowest net cost per pound. It saves you water and time as well as stock.

We'll be glad to make a layout and estimate on the one best Save-All set-up for you.

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BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

TAPPI Engineering

(Continued from page 7)

Ahrens, Richard, Improved Paper Mach. Corp.; Alderfer, Walter A., Ohio Boxboard Co.; Allen, Samuel L., J. E. Rhoads & Sons; Armstrong, Bruce, Jackson & Church; Armstrong, W. P., Hewitt-Robins, Inc.; Arnold, Hartley R., Union Bag & Paper Co.; Atkinson, J. D., Jr., Buckeye Cotton Oil Co.

Bailey, Edward Thompson, International Paper Co.; Baker, Rest R., Westinghouse Elec. Corp.; Ball, Alfred N., E. B. Eddy Co.; Barker, Marshall L., Beckett Paper; Barnes, Richard T., Jr., Int. Nickel Co., Inc.; Barry, T. M., Fraser Paper, Ltd.; Beeman, C. C., Jackson & Church; Bennett, Murray H., Chemical Linings, Inc.; Bentz, Russell H., P. H. Glatfelter Co.; Berger, Robert C., General Electric Co.; Bergstrom, R. E., Swenson Evaporator Co.; Beveridge, J. B., Huron Forest Products Ltd.; Bingham, R. T., TAPPI; Bixler, A. L. M., Reigel Paper Corp.; Brabender, George J., Marathon Corp.; Branche, Arche E., Stebbins Engrg. & Mfg.; Brenner, Kenneth W., Eastman Kodak; Bryant, Hazen F., Crossett Paper Mills; Burdick, Lewis C., St. Regis Paper Co.; Burr, R. S., American Brass Co.; Burstein, Victor, Michigan Paper Co.

Calkins, Donald L., Wausau Paper Mills Co.; Call, Roy D., Westinghouse Elec. Corp.; Campbell, Allen R., Westinghouse Elec. Corp.; Cassell, Chas. W., John Strange Paper Co.; Celli, M. C., Rust Engineering Co.; Charbonnier, H. Y., Union Bag & Paper; Clark, Elroy E., Blandin Paper Co.; Coker, Wm. V., Camp Mfg. Co.; Cooper, A. M., Westinghouse Elec. Corp.; Cornell, John, Paper Mills News; Coughlin, Wm. N., American Coating Mills; Couture, J. Walter, Black Clawson, Dilts Div.; Crane, Arthur E., Crane & Co., Inc.; Crawford, E. A., Continental Paper Co.; Crawford, K. S., Union Screen Plate Co. of Canada; Crockett, Robert E., Int. Paper Co.; Cronkin, Howard J., Int. Paper Co., Research Division; Cruthirds, R. J., Gaylord Container Corp.; Cummings, Curtis D., SKF Industries, Inc.; Cunningham, A., Price Bros. & Co., Ltd.

Davidson, J. H., Minnesota & Ontario Paper Co.; Demers, C. D., Taylor Instrument Co.; De Pan, Raymond T., Downingtown Mfg. Co.; Dixon, Marvin H., St. Regis Paper Co.; Doane, Foster P., Jr., The Sandy Hill Iron & Brass Works; Doering, Edward H., Paper Trade Journal; Donley, E. H., The Babcock Wilcox Co.; Downs, Henry W., Jr., Union Screen Plate Co. of Canada; Driscoll, Merwyn R., International Paper Co.; Duggan, Howard W., Stebbins Eng. & Mfg. Co.

Edwards, Vance P., Int. Paper Co.; Egan, Edward F., Frank W. Egan & Co.; Ehemann, Geo. C., Olin Boxboard Co.; Ekhlas, Mohammed, Pakistan Government.

Fahrenkrug, W. J., Badger Paper Mills Inc.; Fallon, J. F., J. O. Ross Engr. Corp.; Farmer, Jefferson, Hollingsworth & Whiting Co.; Farra, Harry J., The Moore & White Co.; Farrell, Clyde A., Mead Corp.; Flemming, K. H., Hammermill Paper Co.; Fogerty, Merton S., Sutherland Paper Co.; Foster, S. L., Kalamazoo Veget. Parchment Co.; Funk, William H., Lukens Steel Co.

Gaines, T. F., Buckeye Cotton Oil Co.; Gallagher, C. V., River Raisin Paper Co.; Garland, George W., Dudley Garland & Jensen; Garrison, W. A., J. E. Rhoads & Sons; Gearhart, Davis B., Gen. Elec. Co.; Gendron, Clement, Fitchburg, Pa., Co.; Gifford, Wardwell, Hollingsworth & Vose Co.; Gillespie, W. F., Gaylord Container Corp.; Gilsdorf, Charles, Mead Corp.; Glatfelter, Theo. M., P. H. Glatfelter; Gleason, E. P., Nekoosa Edwards Paper Co.; Goelz, Geo. N., Blandin Paper Co.; Goldsmith, Philip H., The Pusey & Jones Corp.; Goodwin,

(Continued on page 32)

INDUSTRIAL PRODUCTION, BY INDUSTRIES

(Without Seasonal Adjustment)

[Index numbers of the Board of Governors, 1935-39 average = 100]
Source: Federal Reserve Bulletin, August, 1948

Industry	1947 Aug.	Sept.	Oct.	Nov.	Dec.	1948 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Paper and Paper Products	*158*	*159*	*163*	*165*	*157*	*163*	*163*	*167*	*169*	*170*	*165*	*149*	*165*
Paper and pulp	152	153	157	160	152	157	159	160	163	164	160	145	160
Pulp	176	170	177	182	168	174	178	179	182	188	r183	170	192
Groundwood pulp	100	98	97	103	97	91	98	96	107	112	107	104	107
Soda pulp	105	104	107	112	107	109	110	103	108	112	111	96	110
Sulphate pulp	278	259	275	281	255	276	269	285	293	309	301	283	328
Sulphite pulp	151	149	154	159	148	151	161	153	151	151	146	135	150
Paper	149	150	154	156	150	155	156	157	160	160	156	r141	155
Paper board	178	182	184	186	177	187	179	192	192	191	187	165	184
Fine paper	86	87	89	89	86	86	88	85	87	86	r86	r74	83
Printing paper	157	157	167	168	162	162	170	161	166	169	168	r150	160
Tissue and absorbent paper	148	151	154	158	153	161	167	161	173	169	160	r153	161
Wrapping paper	138	135	141	146	139	145	150	148	151	150	145	r135	152
Newsprint	93	97	91	91	87	82	83	82	91	95	95	91	95
Paperboard containers (same as Paperboard)	...	...	...	...	...	...	...	...	...	...	...	...	...

r—Revised.

HOURS AND EARNINGS OF PRODUCTION WORKERS IN MANUFACTURING INDUSTRIES

[Compiled by the Bureau of Labor Statistics]

Industry group	Average hours worked per week: 1947 June	July	1948 Mar.	Apr.	May	June	July	Average hourly earnings (cents per hour): 1947 June	July	1948 Mar.	Apr.	May	June	July
All manufacturing	*40.2*	*39.8*	*40.4*	*40.1*	*39.9*	*40.2*	*39.9*	*122.6*	*123.0*	*128.9*	*129.2*	*130.1*	*131.5*	*133.2*
Durable goods	*40.7*	*40.0*	*40.9*	*40.5*	*40.1*	*40.7*	*40.2*	*130.3*	*130.5*	*135.2*	*135.7*	*136.6*	*138.3*	*140.6*
Nondurable goods	*39.8*	*39.7*	*39.9*	*39.6*	*39.6*	*39.8*	*39.5*	*114.0*	*115.0*	*122.0*	*122.0*	*123.0*	*124.2*	*125.2*
Paper and allied products	42.9	42.9	43.1	42.7	42.8	42.8	42.6	116.5	119.0	124.7	125.0	126.9	129.2	131.7

NOTE.—Preliminary August 1948 figures for average weekly hours and hourly earnings are: All manufacturing, 40.0 and 134.5; Durable, 40.7 and 142.2; Nondurable, 39.4 and 126.4, respectively. Back figures are available from the Bureau of Labor Statistics.

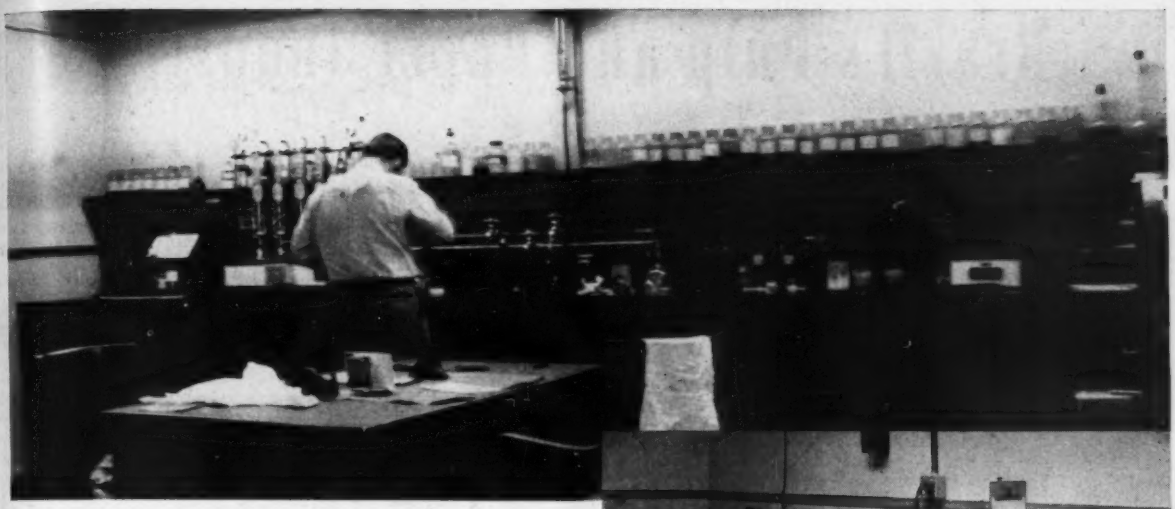
FACTORY EMPLOYMENT AND PAY ROLLS, BY INDUSTRIES

(Without Seasonal Adjustment)

[Index numbers of the Bureau of Labor Statistics, 1939 = 100]

Industry group or industry	Factory employment: 1947 July	Aug.	1948 Apr.	May	June	July	Aug.	Factory pay rolls: 1947 June	July	Aug.	1948 Apr.	May	June	July
Paper and Allied Products	*143.3*	*145.7*	*146.8*	*146.5*	*146.9*	*146.1*	*148.7*	*303.4*	*304.2*	*307.2*	*325.7*	*331.1*	*337.8*	*341.7*
Paper and Pulp	143	145	148	149	148	150	....	307	315	317	333	343	348	359
Paper goods, n.e.c.	160	161	163	163	164	160	....	323	317	314	351	355	358	355
Paper boxes	134	138	134	132	134	131	....	284	274	280	293	290	305	295

NOTE.—Underlying figures are for pay roll period ending nearest middle of month and cover production workers only. Figures for August 1948 are preliminary. Back data and data for industries not here shown are obtainable from the Bureau of Labor Statistics.



40% OF ORR FELTS CHEMICALLY TREATED

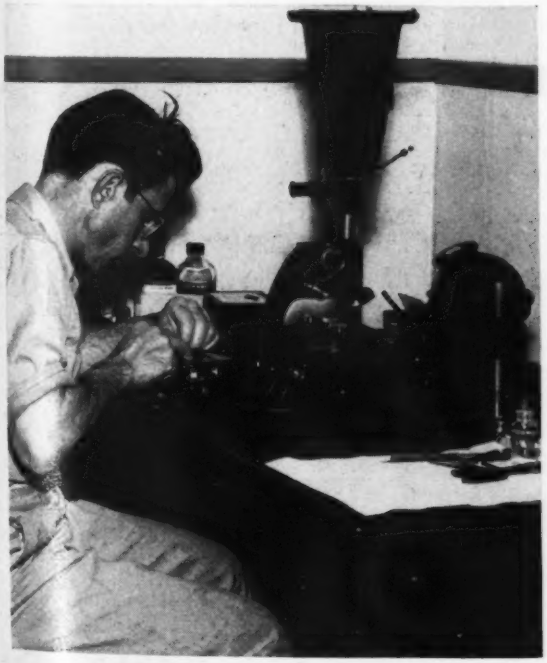
ORR-CHEMS go on the machine better

ORR-CHEMS have better dimensional stability

ORR-CHEMS drain better

ORR-CHEMS almost invariably wear longer

ORR-CHEMS require fewer wash-ups



If not already an ORR-CHEM user and booster, place a trial order. Your machine will like Orr-Chems. Your machine crew will like them. You'll like them.

Also Standard Untreated Orr's for all machines as heretofore

THE ORR FELT & BLANKET CO.

PIQUA, OHIO

ORR-CHEM

Brazil's Pulp and Paper Industry

WASHINGTON—Pulp and paper manufacturers in Brazil recently have been short of funds; many have been forced to maintain production and sell at lower prices in order to meet their obligations, the Office of International Trade of the Dep't. of Commerce states. In the second quarter of 1948, several mills had material in custom which they were unable to withdraw. However, there were indications that the market for domestic paper would improve as import control measures, which became effective on May 6, began to show results, and as small mills dropped out of the picture and the larger ones readjusted production schedules.

"The current unfavorable financial position of the pulp and paper mills, according to trade sources," the OIT continues, "is the result of over-expansion after the war. Although the demand for domestic paper was active during the war, and many mills planned to increase their production capacities, the market for locally manufactured paper decreased, and prices dropped when Scandinavian and United States paper again became available. At the same time, long-standing orders for machinery and raw materials for the pulp and paper industry started to be received; therefore, the mills were faced with heavy debts and a poor market. Recently, paper manufacturers have attempted to economize on production costs by using increased quantities of waste paper and by mixing locally produced mechanical pulp with imported chemical pulp. In many instances, the quality of the paper has deteriorated. A few of the smaller mills have been forced to close.

"An advertising slump so far this year has curtailed consumption to some extent. In addition, the book publishing field has been less active. However, consumption of other types of paper apparently has not fallen off, although purchases are confined to specific job requirements.

"The general price trend continued downward, according to an August report, and recently chemical pulp prices have decreased about five percent. Quotations for Swedish pulp, c.i.f. Santos and Rio, were about $185 per metric ton for unbleached sulphate, $195 for unbleached sulphite, and $240 for bleached sulphite. Stocks were unusually high. The wholesale price of writing paper of superior quality was 8.50 cruzeiros[1] per kilogram in August 1948, compared with 9 to 9.20 cruzeiros in January 1948, a peak of about 12 cruzeiros in 1946, and 2.50 cruzeiros in 1939.

" Approximate prices for imported newsprint, c.i.f. Rio, given in metric tons, were as follows in August: Canadian, $157; Swedish, $185; Finnish, $200; and Norwegian, $220. Canadian newsprint was preferred because of price and quality, but sufficient supplies were not obtainable. In August, newspapers were reported to have very adequate newsprint stocks.

"Newsprint production by the Industrias Klabin do Parana mill at Monte Alegre did not reach the anticipated total of 2,500 tons monthly during the second quarter of 1948, but the June output came to 2,300 tons, and production was increasing. Although this paper is reported to break more readily and is darker in color than the imported paper, it has found a ready domestic market and is less expensive than the Canadian. According to a recent *informal* decision by the Bank of Brazil in regard to establishing a tentative import quota for 1948, minimum requirements of newsprint were fixed preliminarily at 75,000 tons annually. The Klabin mill is to be relied upon to supply between 25,000 and 30,000 tons, and import licenses probably will be granted for an amount up to 50,000 tons.

"Chemical pulp imports amounted to 21,994 tons and were valued at 91,581,000 cruzeiros in the first 4 months of 1948, compared with 22,809 tons valued at 64,204,000 cruzeiros in the corresponding period of 1947. Imports in all of 1947 amounted to 103,377 tons, the largest on record. Newsprint imports totaled 19,368 tons and were valued at 68,232,000 cruzeiros in the first four months of 1948, compared with 18,731 tons valued at 57,009,000 cruzeiros in the corresponding period of last year; imports of other paper items decreased to 6,293 tons from 7,654 tons.

"During the initial licensing period,[2] April 6 to 30, 1948, nine import permits for paper were granted by the Carteira de Exportacao e Importacao of the Bank of Brazil. These totaled 2,415 tons and were valued at $455,850, distributed as follows by country of origin: Canada, 1,961 tons valued at $321,450; Finland, 339 tons valued at $74,700; and the United States, 115 tons valued at $59,700. The permits to Canada and Finland were for watermarked newsprint and printing paper, whereas those to the United States were chiefly for fruit wrappers and paperboard for hat bands. The total permits of all kinds issued during April indicate that soft-currency countries of origin are preferred. An important criterion apparently used in screening import applications is to restrict the importation of unessential articles and those produced satisfactorily in Brazil. (Report by H. Reid Bird, United States Embassy, Rio de Janeiro.)

[1] 1 cruzeiro equals $0.0534, United States currency.

[2] Supplementary regulations implementing the Brazilian law of February 23, 1948, which law placed all imports and exports (with certain exceptions) under a prior licensing system, were published on April 6, and effective 30 days thereafter.

NAWMD Convention Committee Named

NEW YORK—Arthur U. Claghorn of the Pioneer Paper Stock Co., and Louis Lippa of the Apex Smelting Co., both of Chicago, have been appointed chairman and co-chairman respectively of the convention committee for the 36th Annual Convention of the National Ass'n., of Waste Material Dealers, Inc., by President Sidney Danziger.

The Convention will be held at the Stevens Hotel, Chicago, on March 21-23, 1949. Members of the committee, in addition to the above are: Jean B. Charak, Federal Paper Stock Co., St. Louis; and Louis B. Cline, Cline & Bernheim, Nashville. Also Jack M. Cohen of B. Cohen & Sons, Samuel Cohen of the Sangamon Paper Grading Co., Arnold Epstein, Continental Paper Grading Co., Morton A. Friedman of L. A. Cohn & Brothers, Inc., William Glassenberg of R. Lavin & Sons, Inc., Joe Harris of Benjamin Harris & Co., Irving Levin of Dry & Co., Sol Levine of Peoples Iron & Metal Co., Max Schlossberg, Max Schlossberg Co., Harold Shilling, U. S. Paper Supply Co., Emanuel Singer of H. Kramer & Co., and Alfred Stein of H. Muehlstein & Co., Inc., all of Chicago; Stuart B. Sutphin, Jr., of the I. V. Sutphin Co., Cincinnati; Joseph H. Tyroler of Tyroler Metals, Inc., Cleveland; Harold Weinstein of Calumet Iron & Supply Co., East Chicago, Ind., and Morris W. Zack of the M. W. Zack Metal Co., Detroit.

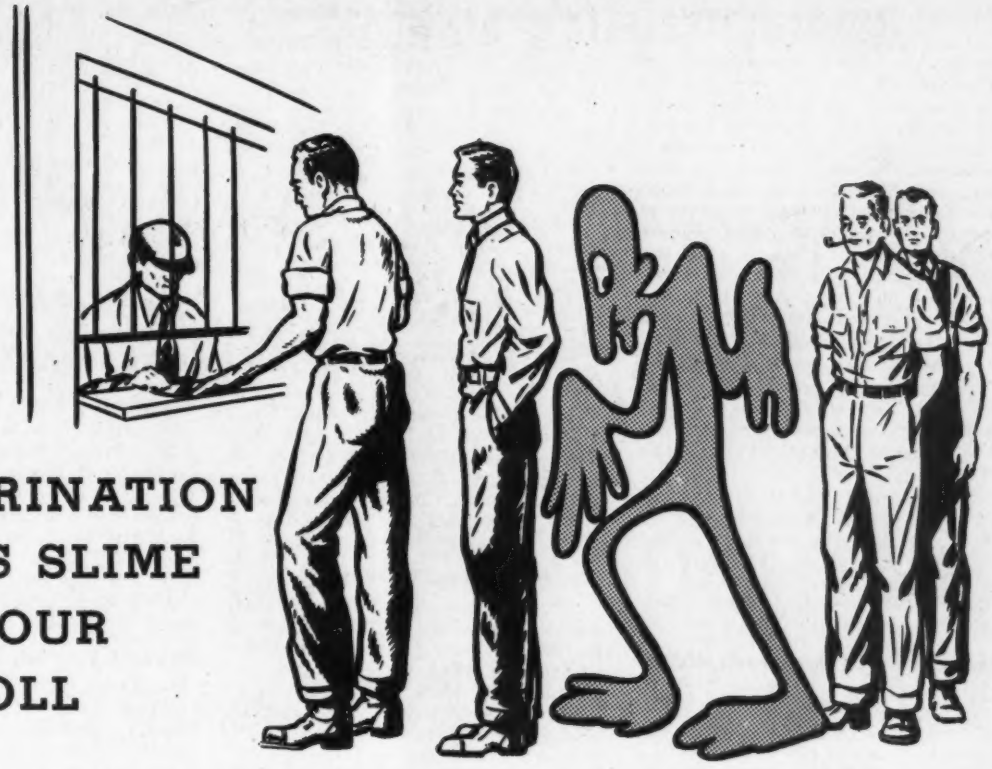
The first meeting of the committee will be held at the Stevens on November 16.

Lake States TAPPI Meet

APPLETON, Wis.—The Lake States Section of TAPPI will meet at the American Legion club house here at 6:30 p. m. on November 9, when Wm. Heilig will speak on "Application of Valves to the Pulp and Paper Industry." Mr. Heilig is vice-president and the chief metallurgist of the Wm. Powell Co., Cincinnati.

Freer Leaving F.T.C.

WASHINGTON — Robert E. Freer, chairman of the Federal Trade Commission, disclosed on October 28 that he plans to submit his resignation sometime during December in order to re-enter the private practice of law on January 1, 1949.

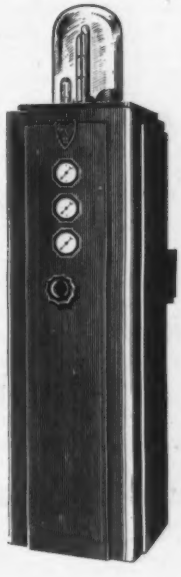


CHLORINATION KEEPS SLIME OFF YOUR PAYROLL

Of course slime doesn't actually stand in the monthly payroll line, but nevertheless it *does* cost you money just as effectively — for example, off-quality breaks, stock losses and screen plugging.

To reduce these losses on your cost sheet, use a method already proven by performance in scores of paper mills throughout the country — Break-Point Chlorination, engineered by Wallace & Tiernan.

Applied to your fresh-water supply after a careful survey by Wallace & Tiernan Engineers, this method controls slime by destroying its major cause—bacteria. Moreover, Break-Point Chlorination used in conjunction with chloramines or other corrective chemicals for stock or white water treatment, can ensure production of a sterile paper or board—a factor of prime importance in food and dairy packaging.



Write today to learn how these advantages of Break-Point Chlorination—backed by Wallace & Tiernan's 35 years' experience in water purification—can go to work for your mill.

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COMPANY, INC.
CHLORINE AND CHEMICAL CONTROL EQUIPMENT
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

I-18

Powell River Ups Output

VANCOUVER, B. C.—The Powell River Co's. latest papermaking machine—No. 8—has gone into operation. Installation of the new machine and the steady improvements in machine efficiency will not meet all demands of publishers, President Harold S. Foley states. Demand has increased, rather than diminished since decision to install an extra machine. The designed 2,000-ft.-a-minute speed of the new machine compares with 670 ft. of the four older machines, built in 1910 and 1912; with 1,000 ft. on the No. 5 and No. 6 machines and 1,400 ft. on No. 7.

In the past few years, in an attempt to meet incessant demand for more newsprint, these machines have far exceeded their designed capacities, and have produced an extra 100 tons daily, it is said.

An additional 10,000 hp was required for the No. 8 machine and this involved heightening the Scanlon Dam by 20 ft. A new generator was also installed, and these projects alone involved expenditures of about $100,000,000.

Richards Marks Centennial

ATLANTA—The S. P. Richards Paper Co., this city's oldest business establishment, is celebrating its hundredth anniversary this month. The firm was organized in Macon in 1848 and set up offices here in 1885. Walter A. Rhodes is president; A. Warren Rhodes, vice-president; Phillip A. Rhodes, treasurer, and T. E. Bridges, Jr., secretary. Russell E. Richards, chairman of the board and son of the founder, has been active in the firm for 62 years.

Bettering Public Relations

OSWEGO, N. Y.—First of a series of gatherings of officials and executives of the three divisions of the St. Regis Paper Co., in Oswego, designed to improve the company's position in this community, was held at Hotel Pontiac on October 13. Officials present from other places included E. R. Gay, William R. Adams, R. P. Bushman and W. E. Hahn.

Forms Colonial Paper Co.

PHILADELPHIA—The Colonial Paper Co., Inc., has been formed by Charles J. Riewe, who recently resigned as a director of L. K. Mallinckrodt, Inc., and as vice-president of the Rittenhouse Paper Corp. The new firm will deal in paper, bags, and paper products.

Gift to Girl Scouts

SAVANNAH, Ga.—A building erected in the center of Gordonston Park here by the Union Bag & Paper Corp., was presented to the Girl Scout Ass'n. of Savannah at dedicatory ceremonies on October 14.

Hobson Miller Adds Three

Hobson Miller Paper Co., Inc., has added George Robinson, William McAndrew and I. Thomas Roberts to its sales staff.

Turcotte at Quebec Meet

WASHINGTON—Lawson P. Turcotte, executive vice-president of the Puget Sound Pulp & Timber Co., Bellingham, Wash., was the paper industry representative on the U. S. Section of the Canada - United States Committee of the Chamber of Commerce of the U.S., which met at Quebec, on October 11-13.

Subjects discussed at the meeting were Customs Administration, Joint Defense, Agricultural Agreement, U.S. Dollar Shortage, Invisible Tariffs, Hidden Customs Restrictions, Industrial Organization for Defense, an Atlantic Pact of the North American and Western Union (United States of Europe) of European Nations, Renewal of the Trade Agreement Act, Monetary and Exchange Agreements, the Geneva General Agreement on Tariffs and Trade, International Trade Organization Charter, International Wheat Agreement and other phases of economic cooperation.

Marcal Sales Meeting

ATLANTA, Ga.—The fall sales meeting of Marcal Paper Mills was held at the Henry Grady Hotel here, October 19-20, with sales representatives attending from the Carolinas, Georgia, Florida and Alabama. Bill Bishop, Georgia district manager, was chairman. Speakers included George W. Eckert, national sales director, of Patterson, N. J., and Ralph Campbell, Southern division sales manager.

Winning Safety Honors

CHICAGO — First among 57 mills in its category in the National Safety Contest conducted by the National Safety Council for the year ending July 1 was the Kimberly-Clark Corp. of Neenah, Wis. Second place was won by the International Paper Co., Niagara Falls, N. Y., and third place was won by the Crown - Zellerbach Corp., Port Townsend, Wash., division.

Claremont Sales Agent

NEW YORK — The Crown-Mark Paper Organization has been appointed sales agent for the Claremont Paper Corp. of New Hampshire. Sale of the mill's products, in addition to being handled through the main office in New York, will be directed through branches at Springfield, Mass., Chicago and Los Angeles.

Repairing Warrensburg Flume

WARRENSBURG, N. Y. — Workers started repairing the flume at the Warrensburg Pulp & Paper Co., on October 1. When the repairs are completed it is expected that there will be sufficient power available to operate all the grinders at the plant.

West Coast Whaler

SAN FRANCISCO—Charles H. Beckwith, with offices at 240 Market street, has been named West Coast sales representative for the Whale Safety Paper Co., Waupaca, Wis.

New St. Regis Department

NEW YORK—C. Russell Mahaney, vice-president of the St. Regis Paper Co., and general manager of that company's Panelyte Division, reports the creation of a material and control department for the division to expedite production and improve service to customers. C. L. Walters is supervisor.

P. P. Ryan has been named as assistant general manager of the Panelyte Division; W. E. Caldwell, plant manager.

The new department will be headed by W. O. Zelin, general plant superintendent; and A. Repas, production superintendent.

Wagner Plant Expansion

BUFFALO, N. Y.—A $175,000 expansion program for the 28-year-old Wagner Folding Box Corp., 1534 Bailey avenue, to be completed early in December, has been announced by George A. Mattis, president and general manager. The outlay includes construction of a new one-story addition and installation of modern box-manufacturing equipment.

Dixie's Bryce, Host

MEMPHIS, Tenn. — Wm. H. Bryce, vice-president of the Dixie Waxed Paper Co. and deputy chairman of the Memphis branch of the Federal Reserve Bank of St. Louis, was host to visiting Board members and Rotarians, when he entertained them with a plant inspection tour of his firm's properties in this city on October 12.

On 4-Day Week

OSWEGO, N. Y.—The Taggart bag plant of the St. Regis Paper Co., will operate on a reduced four-day week starting the week of October 25. The plant is the last in the St. Regis group to feel the effects of a business recession that began several weeks ago, according to M. K. Charlton, general superintendent.

Clevenger Lily-Tulip P. A.

NEW YORK — R. L. Clevenger who has been in charge of purchasing for the company's Mid-West division for a number of years has been named general purchasing agent of the Lily-Tulip Cup Corp. He will be permanently located in the New York office.

New McGregor Owners

CHICAGO — Harry W. Bowers, Jr., formerly with the Whitaker Paper Co., is now president of the McGregor Paper Co., 1400 West Adams street. Ralph H. Burnett, who represented the American Writing Paper Corp. in Chicago for the past 14 years, is treasurer.

New "Man of Distinction"

BOSTON—A portrait of Russell W. Whitney, vice-president of the Hindle & Dauch Paper Co., was used in a Webster cigar advertisement in a recent issue of the *Boston Herald*. The ad was captioned "Tops With Top Executives."

New Compactness
New Simplicity
New Accessibility

The NEW BROUGHTON

Hydraulic, Oscillating Shower

To the recognized advantages of the Broughton S-13-H Shower, you can now add important improvements in operation and servicing.

For this new Broughton Shower takes an impressive step forward in simplicity, yet with greater thoroughness in cleaning accompanied by tremendous savings in water.

Its new hydraulic oscillator has only two moving parts. Think what that means in eliminating maintenance headaches. No oil, grease, mechanical or electrical connections.

Precision made nozzles are sized and spaced to suit mill conditions and sturdy support is provided by ample Bronze bracket. Rigid 2" inner tube of monel and hard drawn copper outer tube 2½" diameter provide compact substantial design, easily kept clean and requiring minimum space. We invite you to write for full details.

A. E. BROUGHTON & COMPANY
GLENS FALLS, N. Y.

Midwest Representatives, RONNINGEN ENGINEERING SALES, Vicksburg, Mich.
Canadian Representatives, SHERBROOKE MACHINERIES LTD., Sherbrooke, Quebec
Mfd. and Sold in Europe by INGENIORSFIRMAN FLIESBERG AKTIEBOLAG, Stockholm 7, Sweden.

Also manufacturers of Broughton Unit Vacuum Control Systems for Flat Boxes, and Hydraulically Oscillated Showers for cleaning Cylindrical Screens, Cylinder Moulds, Felts, Fourdriniers, etc.

Trends

Office of the PAPER TRADE JOURNAL,
Wednesday, November 3, 1948.

Market Aspects

Thumbnail reports from the trade indicate that the pickup enjoyed by fine papers in September has evaporated, demand has leveled, and heavy selling is being required. Tissues have softened considerably in supply with the transfer of production from toilet tissue to regular grades. Price of No. 2 has been forced down some 20c per ream at most mills. Toilet tissue is in good supply again and at competitive prices. (See Quartermaster Purchasing Office Bids for 11,000,000 rolls published elsewhere in this issue) Demand for special cover stock and special book is reported as good. Regular stock moves more slowly. Kraft wrapping and bag are in good demand. Other grades of wrapping are down somewhat. Paperboard demand is fairly steady for most grades with prices generally firm. Some softening noticeable in Plain Chip to $85.00 reported. It is generally conceded that a return to prewar pattern is taking place with renewed emphasis on quality, that post-election may bring some upturn in demand, but that the paper and paperboard industry will continue to enjoy a steady growth after this interim of adjustment.

Whether the lull in general business is an "interim of adjustment" or an indication of the end of the postwar boom is giving much concern to the nation's economists and financiers. Relevant sections of their reports are quoted:

Dun & Bradstreet

"Total industrial production was sustained at a high level during the week ended Wednesday, October 28; the volume of output remained moderately above that of the corresponding week a year ago. Consumer buying increased slightly in response to seasonal promotions and favorable weather in many parts of the country. Consumer interest was largely in merchandise of good quality at moderate prices. Wholesale order volume generally continued near the high level of previous weeks, although slight declines were reported in some regions."

Federal Reserve System

"The Board's seasonally adjusted index of industrial production was maintained in September at 191 percent of the 1935-39 average. Manufacturing output showed a small gain, while minerals production declined 3 percent. Steel mill activity in September was at a rate of 96 percent of capacity as compared with 93 percent in August. Output of electric steel reached a new record level. In the third week of October, total steel production was scheduled at a rate of 99 percent of capacity. Activity at most metal fabricating plants showed little change in September. Automobile production was curtailed further but increased sharply in the last week of September, reflecting mainly settlement of strikes at suppliers' plants. Output of lumber and stone, clay and glass products declined somewhat in September. Production of nondurable goods rose slightly in September and was at a level close to the June rate. Cotton consumption and production of paperboard and rubber products showed small further gains from the reduced summer levels. Output of petroleum products was reduced somewhat in September mainly because of labor disputes at refineries in California. Production of coal declined somewhat in September and the first half of October and was below a year ago levels, reflecting some reduction in demand, mainly for export.

N.A.P.A.

National Association of Purchasing Agents, reporting through the chairman of their business survey committee, Mr. Robert C. Swanton, director of purchases for the Winchester Repeating Arms Div. of Olin Industries, Inc., believe that business may have passed the peak of the postwar boom but that it will continue in substantial volume for the balance of 1948 with a possible post-election rise. Production is found to be high, prices showing a tendency downwards, purchasing agents cautious, and a definite return to competitive markets developing.

Economic Indicators

October report of Economic Indicators, prepared for the Joint Committee on the Economic Report states that: Preliminary 3rd quarter estimates of the Nation's Economic Budget indicate the total increased about 3 percent above the level for the first half of this year, chiefly as a result of price rises. The Government surplus was greatly reduced as tax receipts declined and Federal expenditures increased. *Consumers' prices* rose again in August. A slight drop in food prices was more than offset by a continued rise in other items. *Wholesale prices* during September continued to fluctuate around the August level. *Index of prices* received by farmers dropped moderately from August to September, reflecting bumper crop production. Prices of some major crops appeared to be stabilizing at about support levels. *Industrial stock prices* declined again in September, railroads and utilities registered small gains. *Industrial production* in September moved upward to the June level with the output of durable and nondurable manufactures increasing about equally. Production of transportation equipment decreased in August as a result of a slow-up in automobile production. Production of lumber and steel increased. Textile production in August recovered some of the July drop. Construction was slightly higher in September with a 5 percent increase in public construction more than balancing the decrease in private construction. *Nonagricultural business* plans to spend 15 percent more on plant and equipment this year than in 1947. *Business plans for 4th quarter* show a decline in expenditures of about $1 billion (annual rate) from 3rd quarter with most of the decrease in manufacturing construction. *Manufacturers' inventories continued* to rise in August. Department store sales and stocks showed a slightly more than seasonal decline. Exports leveled off in July. Value of imports decreased. *Per Capita Disposable Income* in 3rd quarter was about 2 percent higher than in 2nd quarter. Purchasing power remained about the same with the price rise about offsetting the income increases. *Durable purchases* rose nearly 8 percent in the 3rd quarter as increased output made more goods available. Expenditures for nondurables and services were also up somewhat. *Consumer* credit increased again in August. Instalment credit rose about 4 percent, one-third of which was attributable to automobile sales. Commercial bank loans increased again in August. Government security holdings dropped a little. Money supply increased again in August, chiefly as result of a rise in private demand deposits. Excess of Federal cash receipts over cash payments for the 1st half of 1948 was $7.6 billion. Preliminary estimates for the last half of 1948 indicate a close balance."

AP & PA

"During 1948, a number of industries have caught up with postwar demand and have suffered slight letdowns when postwar inventory rebuilding terminated. This has occurred at different times with different industries. In general, the indications are that over all the paper industry has been in the process of gradually making this adjustment grade by grade. Orders unshipped or on hand have been gradually getting closer to prewar levels and that overall stocks on hand at the mills have risen appreciably in the last few months."

Indexes

Index of general business activity for the week ended October 23 rose to 151.2 from 148.3 in the preceding week, compared with 145.2 in the corresponding week of 1947.

Index of paperboard production eased to 176.9 from 176.5 in the preceding week, compared with 169.8 in the corresponding week of 1947.

Comparative ratios of U. S. paper and paperboard production to mill capacity as reported by AP&PA are:

	Oct. 23 1948	Oct. 16 1948	Oct. 25 1947	Oct. 26 1946	Oct. 27 1945
Paper**	100.3	99.9	110.2	106.8	95.8
Paperboard ..	95.0	97.0	101.0	101.0	98.0

** Indicates 1948 volume of 180,341 tons. Comparable week 1947—174,648 tons.

Paperboard Production (Tons)

	Oct. 23 1948	Oct. 16 1948	Oct. 25 1947
Production	189,737	192,539	182,173
New Orders	161,905	185,610	169,061
Unfilled Orders ...	359,739	384,134	431,860

Percent of Activity, Current 95%; Year, 96%

CAMP
MANUFACTURING
COMPANY ADDS
THIRD
B&W
RECOVERY
UNIT
CMC
CAMP
MANUFACTURING COMPANY, INC.
Recently ordered for installation at Camp Manufacturing Company's Franklin, Virginia sulphate pulp mill is a 350-ton B&W Recovery Unit.
Satisfactory service from the B&W Organization and B&W Products over a period of years influenced the selection of the new unit. Service-proved since the war, today's B&W recovery unit represents the last word in efficient chemical recovery, and reduction, high steam capacity, maintenance simplicity and operating reliability.
B&W
BABCOCK & WILCOX
THE BABCOCK & WILCOX CO.
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N. Y.
WORKS: ALLIANCE AND BARBERTON, O., AUGUSTA, GA.
P-33
FOR PAPER MILLS — B&W-Tomlinson Recovery Units B&W Integral-Furnace, Stirling, Type H Stirling and Cross-Drum Boilers
Boiler Components Pulverizers Fuel Burning Equipment Refractories Process Equipment Alloy Castings Seamless & Welded Tubes for all Pressure and Mechanical Applications

Imports

Week Ending Oct. 30

NEW YORK

Newsprint

News Syndicate Co., Ted, Thorold, 2145 rolls.
News Syndicate Co., Mimi, Thorold, 2109 rolls.
Gilman Paper Co., Tudor Prince, Cornerbrook, 55 rolls.
Clinton Paper Corp., Tudor Prince, Cornerbrook, 859 rolls.
N. Y. World Telegram, Tudor Prince, Cornerbrook, 1244 rolls.
Bato Co., Tudor Prince, Cornerbrook, 790 rolls.

Surface Coated Paper

Gevaert Co. of America, Black Eagle, Antwerp, 35 cs.

Paperhangings

W. H. S. Lloyd & Co., American Veteran, Manchester, 10 bls.
W. H. S. Lloyd & Co., American Flyer, London, 57 bls., 5 cs.

Drawing Paper

Natural Nydegger, Westerdam, Rotterdam, 1 cs.
Halperin Shipping Co., American Flyer, London, 2 cs.
H. Reeve Angel & Co., Inc., Fort Miami, London, 1 cs.

Parchment Paper

Andrews Paper Co., Queen Elizabeth, Southampton, 1 cs.
Gerhard & Hey, Queen Elizabeth, Southampton, 1 cs.

Photo Paper

J. J. Gavin Co., Mauretania, Southampton, 4 cs.
Alco Photo Supply Co., American Flyer, London, 8 cs.
American Express Co., American Flyer, London, 50 drums (base).

Printing Paper

Stevens Nelson Paper Corp., American Flyer, London, 1 cs.

Gold Scroll Paper

Yardley & Co., American Flyer, London, 2 cs.

Tissue Paper

B. F. Drakenfeld & Co., Media, Liverpool, 22 cs.

Rice Paper

Posner & Co., Rattler, Shanghai, 2 cs.
J. E. Bernard & Co., Rattler, Shanghai, 5 cs.

Wall Paper

C. A. Haynes Co., Media, Liverpool, 376 cs.
W. H. S. Lloyd & Co., Fort Miami, London, 6 bls.

Filter Paper

E. H. Sargent & Co., Stockholm, Gothenburg, 16 cs.
H. Reeve Angel & Co., Inc., Fort Miami, London, 31 cs.

Wallboard

Bulkley Dunton Cellulose Export Inc., Stockholm, Gothenburg, 1 cs.
Halltex-Hallman Inc., Pankakoski, Montyluoto, 2320 crates.

Serviettes

(———), Media, Liverpool, 13 cs. (crepe paper).

Gummed Paper

B. F. Drakenfeld & Co., Media, Liverpool, 23 cs.

Writing Paper

American Express Co., American Merchant, London, 3 cs.

Miscellaneous Paper

General Electric Co., Stockholm, Gothenburg, 1 cs.; Pittsburgh Lab. 2 cs.

Rags, Baggings, Etc.

A. de Vries Trading Corp., Leerdam, Antwerp, 86 bls. rags.
A. de Vries Trading Corp., Black Eagle, Antwerp, 68 bls. old scrap bagging.
McKay & Co., Black Eagle, Antwerp, 64 bls. cotton waste.
J. J. Rozendaal, Black Eagle, Antwerp, 8 bls. cotton waste.
National City Bank, Black Eagle, Antwerp, 106 bls. old bagging.
Manufacturers Trust Co., American Veteran, Manchester, 3 bls. wool rags.
Midwest Waste Material Co., Robert Maersk, Antwerp, 101 bls. bagging.
A. W. Fenton Co., Robert Maersk, Antwerp, 56 bls. bagging.
E. J. Keller Co., Inc., Robert Maersk, Antwerp, 75 bls. bagging.
E. J. Keller Co., Inc., Hellenic Beach, Pireaus, 278 bls. rags.
National City Bank, Hellenic Beach, Genoa, 115 bls. old waste bagging.
American Express Co., Media, Liverpool, 30 bls. wool rags.
Midwest Waste Material Co., American Merchant, London, 193 bls. rags.
New England Waste Co., Pres. Fillmore, Bombay, 200 bls. old hessian rags.
E. J. Keller Co., Inc., Pres. Fillmore, Bombay, 100 bls. old jute rags.
Chemical National Bank Trust Co., Pres. Fillmore, Bombay, 60 bls. old jute rags.
J. P. Fleisig, Pres. Fillmore, Port Said, 49 bls. old white cotton rags.
(———), Pres. Fillmore, Genoa, 103 bls. jute bagging.
H. Adlerstein, Pres. Fillmore, Genoa, 138 bls. old jute rags.
(———), Pres. Fillmore, Genoa, 78 bls. scrap bagging.

Casein

Eugenio Lang, Campero, Buenos Aires, 1000 bags.
(———), Rio Aguapey, Buenos Aires, 1000 bags.

ALBANY

Pulp Sales Corp., Pankakoski, Mantyluoto, 270 bls. prime unbleached sulphite pulp; 254 bls. dry mechanically ground woodpulp; 6150 bls. prime bleached sulphite pulp.
National City Bank, Pankakoski, Mantyluoto, 4599 bls. prime unbleached strong sulphite pulp.

BOSTON

American Cyanamid Co., Campero, Buenos Aires, 860 bags casein.
(———), Villar, Buenos Aires, 500 bags casein.

PHILADELPHIA

E. J. Keller Co., Inc., Black Eagle, Antwerp, 131 bls. jute waste.
National City Bank, Hellenic Beach, Genoa, 111 bls. old waste bagging.
E. J. Keller Co., Inc., Robert Maersk, Antwerp, 135 bls. bagging.

NORFOLK

F. P. Gaskell & Co., American Veteran, Glasgow, 32 coated paper (for cigarette Tips).

Tapioca Threat

WASHINGTON—Paper manufacturers will be made dependent on foreign tapioca and sago starches if the corn derivatives industry is forced to abandon freight absorption, the Corn Products Refining Co. and others warned in a brief now before the Federal Trade Commission, asking dismissal of FTC complaints against members of the industry alleging unfair restraint of competition.

Canadian Carloadings Up

OTTAWA—Car loadings on the Canadian railways from the first week of 1948 until the week ending October 16 involved a cumulative total of 178,985 cars of woodpulp and paper as compared with 173,607 cars of same in the similar period last year ending week of Oct. 18, 1947, the Canadian Government reports in its latest survey of such revenue freight.

Canadian ECA Purchases

OTTAWA—Total commodity authorizations for offshore purchases in Canada under ECA for six-months period to Sept. 30 include woodpulp for $5,864,500, pulpwood $826,000, and paper and products for $10,000.

Paper Machinery for Italy

WASHINGTON—A special industry machinery procurement program totaling $8,200,000, authorized for Italy under the ECA, will include equipment and machinery for paper manufacture. it was announced on October 27.

Fibre Box Association Meeting

NEW YORK—H. M. Treen, president of the Fort Wayne Corrugated Paper Co., Fort Wayne, Ind., was reelected president of the Fibre Box Ass'n., at that organization's annual meeting here on October 12-13. As the same time C. W. Trockmorton of Fibre Board Container Co., Richmond, Va., was re-elected vice-president. This is the third term for both men. Thirty-three directors were also elected.

President Treen presented a report of the last year's accomplishments and a forecast for the year to come. He said, "With general business good, with good crops, and with huge back-logs of orders in the all important heavy industries there should be absolutely no reason why the fibre box industry cannot continue to progress along sound and constructive lines."

He continued saying that in his opinion this could be accomplished in the following four ways: Maintain and

(Continued on page 36)

For Exceptional COLORING POWER at Very Low Cost you need Du Pont SOLUBLE BLUE PB-6-D

HERE'S a pigment with very high coloring power, which is very economical for coloring paper in the beater.
It's Du Pont Soluble Blue PB-6-D—a form of Iron Blue—so processed as to give quick and complete dispersion in water.

Soluble Blue PB-6-D has excellent lightfastness. This shows to good advantage in blotting paper, twisting paper, lining stock . . . and any beater applications where a low-cost blue with good light resistance is required.

PB-6-D is standardized for color and strength in beater paper coloring. And you can count on it for uniformity.

A trial order will convince you. See your Du Pont salesman or write E. I. du Pont de Nemours & Co. (Inc.), Pigments Department, 1007 Market Street, Wilmington 98, Delaware.

DU PONT PIGMENTS
FOR QUALITY PRODUCTION

DU PONT

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

Tune in to Du Pont "Cavalcade of America" Monday nights—NBC Coast to Coast

Prices

Quotations indicate trends in an open market. At the moment they can be of little more value. While some volume business still is done under contract at the figures shown, fluctuations are too varied and frequent to permit prices to be interpreted as representing a wholly stabilized market.

NEW YORK

Paper

(Delivered New York)

Standard News, per ton—

Rolls, contract	$100.00/ —
Sheets	115.00/ —

Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.

Superstandard Wrapping	$9.00/ —
No. 1 Wrapping	7.75/ 8.00
Standard Wrapping Rolls	7.00/ —
Standard Wrapping Sheets	7.50/ —
Standard Bag	6.50/ —

Tissues—Per Ream 24x36 (480) 10/11 lbs. Zone 1.

Wh. No. 1 Frd.	$1.84/$2.00
Wh. No. 1 M. G.	1.94/ 2.00
Wh. No. 1½	1.65/ —
Wh. No. 2	1.50/ 1.70
Kraft Anti-Tar	1.65/ —
Kraft Unbl.	1.85/ —
Shred. Wh. No. 1 per lb.	.12¾/ .18

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached	$7.50/$10.00
Bleached	8.75/ 10.00

Paper Towels—Per Case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9½	$5.45
Br. Sr. M'tif'd 10x12	3.80
Br. Jr. M'tif'd 9½x9¾	3.30
Br. Jr. Sgl. fold 10x10¾	3.35

Manila—per cwt.—C-1 f.a.

No. 1 Jute Tag	$14.50/ —
Reg. Jute Manila	13.25/$15.50
No. 1 Manila Wrapping	8.75/ 10.50
5 lb. Manila	10.75/ 11.25

Boards, per ton—

Filled News	94.00/
Plain Chip	85.00/ 90.00
Bichd. Mla. L-d. Chip*	105.00/
White Pat. coated*	120.00/
Kraft Liners 42 lb.	105.00/
Kraft Corr. .009	110.00/
Binders Boards	126.00/

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—

White, 16 lb.

Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$59.00	$54.55	$52.30
100% Rag	52.25	48.30	46.30
75% Rag	41.50	38.30	36.70
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Ledgers, per cwt.

100% Rag Ext. No. 1	$57.00	$52.65	$50.50
100% Rag	50.25	46.40	44.50
75% Rag	41.50	38.30	36.70
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Sulphite Bonds and Ledgers—White, 16 lbs.

Bonds, per cwt.

No. 1	$21.25	$19.25	$18.50
No. 2	20.25	18.30	17.55
No. 4	19.25	17.55	16.85

Ledgers, per cwt.

No. 1	$21.75	$19.65	$18.85
No. 2	20.75	18.75	18.05
No. 4	20.00	18.10	17.35

White Book, per cwt.—

	Case	Ton
Coated		
No. 1 Glossy	$20.90	$20.15
No. 2 Glossy	19.65	18.90
No. 3 Glossy	18.90	18.25
Machine Coated	16.65 to 17.15	16.05 to 16.35
Uncoated		
No. 1 Antique (Watermarked)	16.40	15.80
Offset	15.15 to 17.15	14.60 to 16.40
A Grade E. F.	15.40	14.85
A Grade S. C.	15.90	15.35
B Grade E. F.	15.15	14.55
B Grade S. C.	15.65	14.95

Wood Pulp

Fourth Quarter

Domestic mill contract prices delivered with varying freight allowances.

	Per Short ADT
Groundwood	$80.00/ $81.00
Unbleached Sulphite	124.00/ —
Bleached Sulphite	125.00/ 135.00
Bleached Soda	130.00/ 135.00
Bleached Sulphate	155.00/ 165.00
Unbleached Sulphate Northern	120.00/ 130.00
Unbleached Sulphate Southern	110.00/ 125.00

Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

	Per Short ADT
Bleached Sulphate	$150.00/$160.00
Unbleached Sulphate	125.00/ 135.00
Unbleached Sulphite	125.00/ 126.00
Bleached Sulphite	125.00/ 135.00
Glassine Unbleached Sulphite (no freight allowance)	120.00/ —
Bleached Soda	130.00/ —
Groundwood	80.00/ 85.00
Sideruns Pulping News	80.00/ 90.00

Swedish Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Kraft	$165.00/ —
Bleached Sulphite	165.00/ —
Unbleached Sulphite	140.00/ 149.00
Unbleached Kraft	127.50/ —

Finnish Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$165.00/ —
Unbleached Sulphite	140.00/ 143.00
Unbleached Sulphate	127.50/ —

Norwegian Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$165.00/$175.00

New Domestic Cotton Cuttings

(F.o.b. Ship. Pt. Plus Dealer's Commission)

White Shirt	$10.50/ $11.00
Unbleached Muslin	11.00/ 11.50
Light Silesias	8.50/ 8.75
White Back Blue Overalls	8.50/ 8.75
Blue Overalls	7.75/ 8.00
Fancy Shirt	6.25/ 6.75
Percales	7.00/ 7.25
Light Prints	7.50/ 7.75
No. 1 Washables	5.00/ 5.25
Bleachable Khaki	7.00/ 7.50
Unbleachable Khaki	6.00/ 6.50
Cottonades	5.50/ 5.75

Old Domestic Cotton Rags

(F.o.b. Ship. Pt. Plus Dealer's Commission)

	Per 100 lbs.	
No. 1 Whites, Repacked	$4.00/	$4.50
No. 1 Whites Miscellaneous	3.50/	4.00
No. 2 Whites Repacked	3.25/	3.50
No. 2 Whites Miscellaneous	2.75/	3.00
Blue Overalls	3.75/	4.00
Thirds and Blues Repacked	2.50/	2.75
No. 1 Roofing Rags	1.45/	1.55
No. 2 Roofing Rags	1.35/	1.45
No. 3 Jute Bagging	1.25/	1.35
No. 4 Brussels & hrd. bck'd crpts.	1.25/	1.35
No. 5A Roofing Rags	1.25/	1.35

New Foreign Cotton Cuttings

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.	
New Dark Cuttings	$5.50/	$5.75
New Mixed Cuttings	6.25/	6.50
Light Silesias	9.25/	9.50
Light Flannelettes	9.25/	9.50
New White Cuttings	12.00/	13.00
New Unbleached Cuttings	12.25/	13.00
Fancy Shirt Cuttings	6.50/	7.00
Light Prints	7.75/	8.00
Bleachable Khaki, No. 1	7.00/	7.50
Unbl. Khaki, No. 1	6.25/	6.75

Old Foreign Rags

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.	
No. 1 White Cottons	— /	—
No. 2 White Cottons	— /	—
No. 3 White Cottons	— /	—
No. 4 White Cottons	3.75/	4.00
Extra Light Prints	6.50/	7.00
Old Light Prints	4.50/	5.00
Med. Light Prints	4.00/	4.50
Dutch Blue Cottons	5.25/	5.50
Checks and Blues	4.00/	4.25
Linsey Garments	1.75/	2.00
Dark Cottons, European	1.65/	1.75
Dark Cottons, Egyptian	1.55/	1.65
Old Shopperies	nominal	
New Shopperies	nominal	

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.	
Foreign Gunny, No. 1	$7.50/	$8.50
Domestic Gunny, No. 1	7.50/	8.50
Heavy Wool Tares	7.50/	7.75
No. 1 Scrap Baggins	7.00/	7.25
Roofing Bagging	1.10/	1.20
Foreign Manila Rope	5.50/	5.75
Domestic Manila Rope	6.00/	6.25
Jute Strings	7.00/	7.25
No. 1 Sisal Strings	5.25/	5.50
Mixed Strings	1.50/	1.75

Waste Paper

Base Prices to Mills for Average Packings F.o.b. New York, Baled

	(Per Ton)	
No. 1 Hard White Envelope Cuts	110.00/	120.00
No. 1 Hd. Wh. Shavings, unruled	100.00/	110.00
Super Soft White Shavings	100.00/	105.00
No. 1 Soft White Shavings	90.00/	95.00
No. 1 Fly Leaf Shavings	45.00/	—
No. 1 Gd'wd Fly Leaf Shavings	35.00/	—
No. 1 Heavy Books & Magazines	19.00/	21.00
Mixed Books	13.00/	15.00
No. 1 White Ledger	55.00/	65.00
Col. Ledger	40.00/	45.00
Manila Tab. Cards	65.00/	70.00
New Manila Envelope Cuttings	70.00/	80.00
Extra Manilas	20.00/	25.00
Mxd. Kraft, Bag Cuttings	55.00/	60.00
Kraft Envelope Cuttings	75.00/	85.00
Triple Sorted, No. 1 Brown Soft Kraft	40.00/	45.00
New Kraft Corrugated Cuttings	35.00/	40.00
No. 1 Assorted Old Kraft	35.00/	40.00
Used Kraft Bags	35.00/	40.00
New Jute Corrugated Cuttings	18.00/	—
Old Corrugated	14.00/	15.00
No. 1 News	13.00/	14.00
No. 1 Mixed Papers	6.00/	7.00
Box Board Cuttings	7.00/	8.00
White Blank News	65.00/	70.00
Overissue News	18.00/	19.00
Sulphite Mill Wrappers	12.00/	14.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)	
Coarse Polished—India	.35½/ .36½
Fine Polished India	.41½/ .45
Unpolished—Paper Makers	.32¾/ .34½
Tube Rope	.33¾/ .35½
Wrapping	.36 / .38¾
Cotton	.58 / .60
Polished Cotton	.55 / —
(Hard Fiber)	
Mex. Sisal	.21 / .27
Manila (Reprocessed)	.31 / .35
(American Hemp)	
Polished Hemp	.46½/ .48
Unpolished	.35 / .37¼

PHILADELPHIA

Domestic Rags (new)

(F.o.b. Eastern Shipping Point)

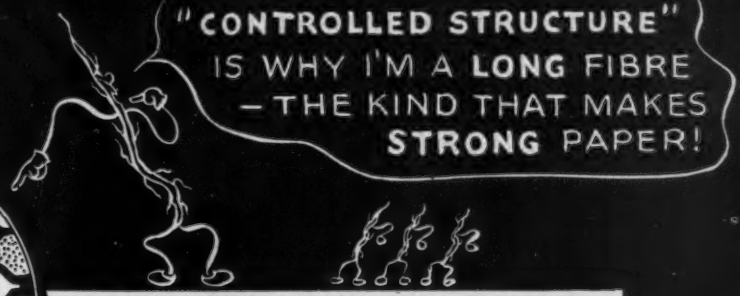
White Shirt	.10½/ .11
Light Silesias	.07½/ .08
Black Silesias, soft	.05½/ .06
Unbleached Muslin	.10½/ .11¼
Washable Prints	.06½/ .07
Washable No. 1	.05 / .05½
Blue Overall	.07½/ .08
Washable Shredding	.02¾/ .03¼
Fancy Percales	.06¾/ .07½
Unbleachable Khaki	.05½/ .06½
Bleachable Khaki	.06¼/ .06¾
Men's Corduroy	.05½/ .06
Ladies' Corduroy	.05 / .05½
Cottonades	.05½/ .06

Domestic Rags (Old)

(F.o.b. Eastern Shipping Point)

White No. 1—Repacked	4.50 / 5.00
Mixed White	4.00 / 4.25
White No. 2—Repacked	3.50 / 3.75
Thirds and Blues—Miscellaneous	2.50 / 2.75
Repacked	3.00 / 3.25
Domestic No. 1 Roofing Stock	1.55 / 1.60
Domestic No. 2 Roofing Stock	1.45 / 1.50
Roofing Bagging	1.35 / 1.40
Old Manila Rope	— / 5.50

(Continued on page 26)



Diagrammatic sketch of Norton Pulpstone showing the uniform, controlled grain spacing that produces long, uniform fibers.

CONTROLLED STRUCTURE is a *Patented* Norton Development

IT takes long, well-fibrillated fibers to make strong paper. And it takes a pulpstone with just the right grain spacing to make such fibers. That grain spacing is not always the same either. It must be different for different types of wood, for different types of grinders.

That's why Norton "Controlled Structure" is important to producers of mechanical pulp. This patented Norton development makes it possible to accurately regulate the spacing of the grains in the stone — to provide just the right grain spacing to produce long, fibrillated fibers from your kind of wood with your kind of grinders.

Norton engineering service is available to study your requirements and prescribe Norton Pulpstones in just the right specifications—not only in structure but also in the kind of abrasive, the grain size and the stone hardness.

NORTON COMPANY, Worcester 6, Mass.
Norton Company of Canada Ltd., Hamilton, Ontario

NORTON ABRASIVES

Prices

CONTINUED FROM PAGE 24

Bagging

(F.o.b. Eastern Shipping Point)

Foreign Gunny No. 1	nominal
Domestic Gunny No. 1	.07¼/ .07¾
Sisal Strings No. 1	.04½/ .05
Sisal Strings No. 2	.03½/ .04
Sisal Jute	.02¼/ .03
No. 1 Scrap	.06½/ .07
No. 2 Scrap	.03 / .03½

Waste Papers

F.o.b. Phila. Mill Prices, Baled

	Per Ton
No. 1 Hd. White Envelope Cuts	120.00/ 125.00
No. 1 Hd. Wh. Shavings, unruled	100.00/ —
Soft White Shavings	85.00/ —
White Blank News	65.00/ 75.00
No. 1 White Ledger	65.00/ —
No. 1 Heavy Books & Magazines	20.00/ 22.00
New Manila Envelope Cuttings	75.00/ —
No. 1 Assorted Old Kraft	35.00/ 40.00
No. 1 Mixed Paper	7.00/ 8.00
Box Board Cuttings	8.00/ 10.00
New Kraft Corrugated Cuttings	55.00/ 60.00
Old Corrugated	14.00/ 16.00
Overissue News	15.00/ 16.00
No. 1 News	11.00/ 13.00

BOSTON

Waste Papers

F.o.b. Boston, Mill Prices, Baled

	Per Ton
No. 1 Hd. Wh. Shav., unruled	$135.00/ —
No. 1 Hd. Wh. Shavings, ruled	90.00/ —
Soft White Shavings	120.00/ 125.00
No. 1 Fly Leaf Shavings	45.00/ —
No. 2 Fly Leaf Shavings	40.00/ 45.00
No. 1 Grdwd. Fly Leaf Shvgs	nominal
No. 2 Groundwood Fly Leaf Shavings	nominal
Mixed Colored Shavings	30.00/ —
New Manila Env. Cuts, one cut	75.00/ —
Hard White Envelope Cuts, one cut	120.00/ —
Triple S'ted No. 1 Br. Soft Kraft	75.00/ 80.00
Mixed Kraft Env. & Bag Cuttings	45.00/ —
Kraft Envelope Cuttings	100.00/ 110.00
No. 1 Heavy Books & Magazines	22.00/ —
New Manila Env. Cutt'gs, one cut	47.00/ —
New Manila Envelope Cuttings	80.00/ 85.00
White Tabulating Cards	80.00/ 90.00
White Blank News	65.00/ —
No. 1 Assorted Old Kraft	50.00/ —
No. 1 Mixed Paper	8.00/ 9.00
Overissue News	11.00/ 12.00
No. 1 News	11.00/ 12.00
New Corrugated Cuttings, Kraft	55.00/ 60.00
Old Kraft Corrugated Containers	35.00/ —
Old Corrugated Containers	13.00/ 14.00
Paper Strings	40.00/ 45.00

Bagging

(F.o.b. Boston)

	(Per 100 lbs.)
Foreign Gunny	nominal
Domestic Gunny	8.00 / 8.25
No. 1 Old Rope	5.75 / 6.25
Mixed Strings	1.35 / —
Transmission Rope—	
Foreign	nominal
Domestic	4.00 / —
Foreign Manila Rope	nominal
Domestic Manila Rope	6.50 / —
Jute Carpet Threads	— / 4.00
Bleachery Burlap	— / 9.00
Scrap Burlap—	
Foreign	6.50 / 6.75
Domestic	6.75 / 7.00
South America	6.75 / 7.00
Austr. Wool Pouches	8.00 / —
New Zealand Wool Pouches	— / 5.50
New Burlap Cuttings	8.50 / —
Heavy Baling Bagging	8.00 / 8.50
Paper Mill Bagging	— / 6.00
No. 1 Roofing Bagging	— / 1.40

Domestic Rags (New)

(F.o.b. Boston)

	(Per 100 lbs.)
New Light Prints	nominal
Fancy Percales	7.00 / —
White No. 1 Shirt	11.00 / —
Light Flannelettes	8.00 / —
Canton Flannels, Bleached	10.00 / —
Underwear Cutters, Bleached	11.00 / —
Underwear Cutters, Unbleached	10.50 / 12.00
Silesias No. 1	7.25 / —
Black Silesias	4.50 / —
Red Cotton Cuttings	4.50 / —
Blue Overalls	— / 8.00
Soft Unbleached	11.00 / —
Blue Cheviots	7.00 / —
Fancy	5.50 / —
Washable	6.00 / —
Khaki Cuttings	6.00 / —
Corduroy	4.00 / —
Men's Corduroy	4.50 / —
Khaki Canvas	— / 6.00
B. V. D. Cuttings	11.00 / —

Domestic Rags (Old)

(F.o.b. Boston)

	Per 100 lbs.
No. 1 Whites, Repacked	4.75 / 5.00
No. 1 Whites, Miscellaneous	4.25 / 4.75
No. 2 Whites, Repacked	2.50 / —
No. 2 Whites, Miscellaneous	2.00 / —
Twos and Blues, Repacked	1.25 / —
Old Blue Overalls	4.00 / 4.50
Thirds and Blues, Repacked	2.00 / —
Black Stockings	3.00 / 3.50
No. 1 Roofing Stock	1.55 / —
No. 2 Roofing Stock	1.45 / —
No. 3 Roofing Stock	1.25 / —
No. 4 Roofing Stock	1.25 / —
No. 5, Quality A	1.35 / —
Old Manila Rope	6.00 / —

CHICAGO

Waste Paper

(F.o.b. Chicago) Mill Prices, Baled

Shavings—	
No. 1 Hard White Envelope cuts, one cut	$100.00/ —
No. 1 Hard White Shavings, unruled	90.00/ —
No. 1 Soft White Shavings	80.00/ —
No. 1 White Ledger	60.00/ —
No. 1 Heavy Books & Magazines	28.00/ 30.00
White Blank News	50.00/ —
Mixed Kraft Env. & Bag Cuttings	70.00/ —
No. 1 Assorted Old Kraft	25.00/ —
Overissue News	22.00/ —
No. 1 News	— / 18.00
No. 1 Mixed Paper	9.00/ —
Old Corrugated	14.00/ 15.00
Mill Wrappers	11.00/ —

Markets

Blanc Fixe

Supply good; demand steady. Pulp is currently quoted at $85.00 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $75.00 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Demand strong. Supply adequate. Prices firm. Export inquiry good. Prices range from $4.25 to $4.75 per 100 pound drums, l.c.l. works.

Casein

Demand continues light. Domestic prices firm, supply light. Argentine market subsides as Japanese order goes to New Zealand. Current prices on processed acid precipitated casein at 28½ to 32 cents per pound for domestic grades and .26 to .28 cents for imported grades, f.o.b. shipping point.

Caustic Soda

Dry types continue short. Liquid types in easier supply. Some 1949 contracts reported at present price levels. Solid caustic is reported at $3.10 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.25 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.60 per cwt.; liquid 73 percent in tank cars at $2.60 per cwt., at works.

China Clay

Demand steady. Supply excellent. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse.

Chlorine

Pickup in demand tightens supply. Shortage of tankcars hampers delivery. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-tank cars, f.o.b., works.

Rosin

Heavy foreign inquiry stimulates buying. Market strong. Prices rising as supply outside loan lessens. Gum rosin in drums per 100 pounds net in car lots, f.o.b., Savannah; B, $6.50; G, H, I, K, $7.75. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

Rosin Size

Heavy demand. Supply good. Seventy percent gum and pale wood grades, tank cars, $6.30 to $6.40, f.o.b. southern shipping point.

Salt Cake

Supply somewhat easier. Heavy kraft production keeps demand steady. Production under contract. Domestic salt cake quoted at $25 to $28.

Soda Ash

Supply continues to improve. Deliveries up to schedule. Current prices sustained in some 1949 contracts. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Sodium Bicarbonate

Demand eased by better supply of other alkalis. Production good. Reported as $1.93 per cwt. paper bags, carload lots.

Starch, Corn

Prices weakening. Follow corn market down with 25c dip. Demand moderate. Pearl grade quoted at $5.91 per 100 pounds; powdered starch at $6.02 per 100 pounds; car lots, New York.

Starch, Potato

Prices unsteady following dip, with indications of further weakening for Maine product. Buying spotty for immediate needs; good for futures. High grade quoted at $5.00 cwt. f.o.b. Idaho; $5.25/$5.75 f.o.b. Aroostook; Pearl grade $5.10/$5.65 cwt. f.o.b. Aroostook.

Sulphate of Alumina

Demand increased. Supply steady. The commercial grades are quoted from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur

Demand active. Supplies steady. Production up 3 percent. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $22.00 per long ton.

Talc

Demand continues in excess of supply. Improvement seen by early 1949. Prices steady. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in car lots.

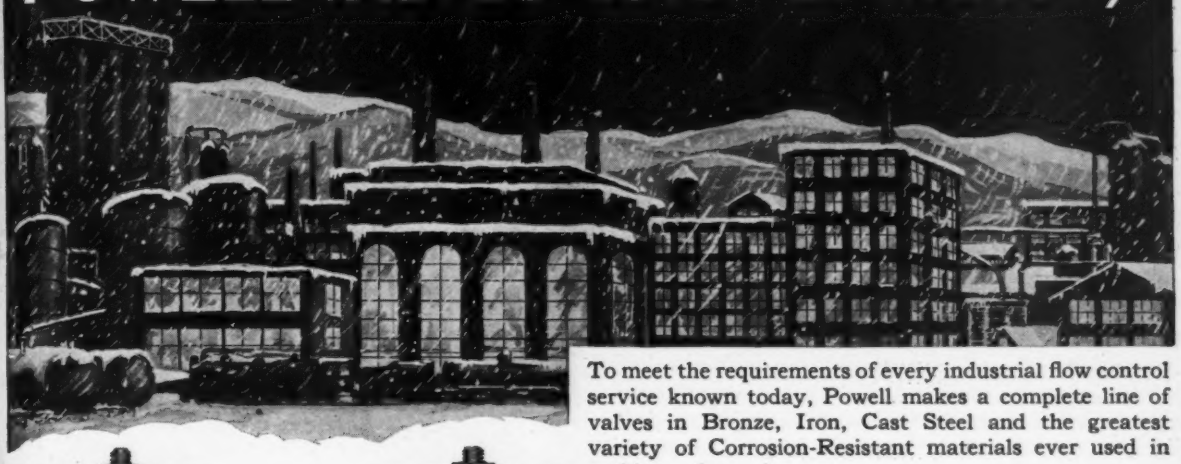
Tapioca Flour

High grades in fair supply and demand. Superior highs range from $10.25/$11.50 cwt.; medium grades $9.25 cwt., on dock Atlantic and Gulf ports; low grades range from $6.50/$7.50 cwt., on dock N. Y. Coarse low grades, $5.50 cwt., on dock N. Y. Medium and low grades in adequate supply.

Titanium Dioxide

Supply of paper grades continues unequal to demand. Shipments on allocation. Anastase 18c pound carload lots, 18½-19c l.c.l., rutile, 20c pound carload lots, 20½-21c l.c.l.; 50-pound bags, f.o.b. plant, minimum freight allowance.

POWELL VALVES cover all Industry



To meet the requirements of every industrial flow control service known today, Powell makes a complete line of valves in Bronze, Iron, Cast Steel and the greatest variety of Corrosion-Resistant materials ever used in making valves.

We cannot introduce "Powell Valves for Corrosion Resistance" as a *new* feature, because with us they are long past the introductory stage. In fact it was more than 25 years ago that the Powell Special Design and Alloy Valve Division was established.

But we *can* feature the fact that today Powell makes the only *complete line* of Corrosion-Resistant Valves available to the Chemical and Process Industries.

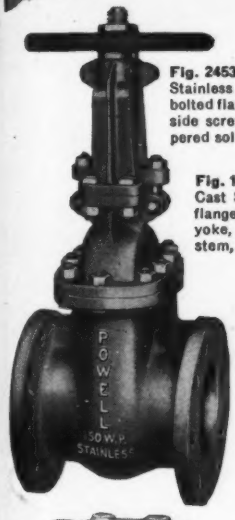


Fig. 2453-G—Large 150-pound Stainless Steel Gate Valve with bolted flanged yoke bonnet, outside screw rising stem and tapered solid wedge.

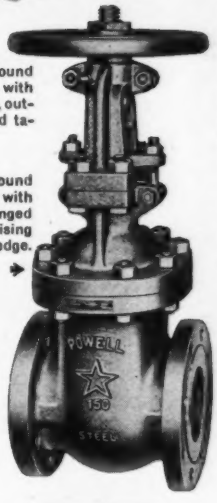


Fig. 1503—Class 150-pound Cast Steel Gate Valve with flanged ends, bolted flanged yoke, outside screw rising stem, tapered solid wedge.

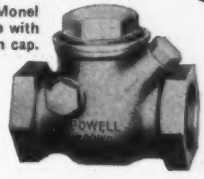


Fig. 1843 — 200-pound Monel Metal Swing Check Valve with screwed ends, screwed-in cap.

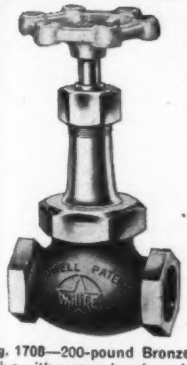


Fig. 1968—150-pound Stainless Steel Gate Valve with bolted flanged yoke-bonnet, outside screw rising stem and tapered solid wedge.

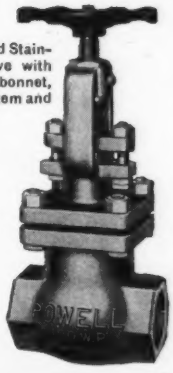


Fig. 2051-NI—150-pound Nickel "Y" Valve with flanged ends, bolted flanged yoke and outside screw rising stem.

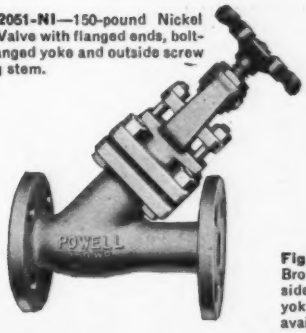


Fig. 1793—Large 125-pound Iron Body Bronze Mounted Gate Valve with outside screw rising stem, bolted flanged yoke and tapered solid wedge. Also available in All Iron for process lines.

Fig. 1708—200-pound Bronze Globe Valve with screwed ends, union bonnet, renewable, specially heat treated stainless steel seat and regrindable, renewable. wear-resisting "Powellium" nickel-bronze disc.

The Wm. Powell Co., Cincinnati 22
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

For full information on applications of Powell Corrosion-Resistant Valves, refer to Powell Catalog No. 242. If you do not have it, write, on company stationery, for your copy NOW!

POWELL VALVES

Financial Record

	Per Share Calendar Year 1947	Earnings 12 Mos. to Approx. 9/30/48	Indic. Annual Divid. Rate	Nov. 3 Closing Market Price
Preferred Stocks				
Armstrong Cork Co. $3.75 Cum.	$38.64*	$43.53*i	$3.75	94½
Armstrong Cork Co. $4.00 Cum. Conv.	38.64*	43.53*i	4.00	108
Celotex Corp. 5% Cum.	24.25c	26.25g	1.00	
Champion Paper & Fibre $4.50 Cum.	65.90f		4.50	
Container Corp. of Amer. 4% Cum.	102.74	98.49	4.00	90
Crown Zellerbach $4.20 Cum.	56.40f	55.07g	4.20	
Crown Zellerbach $4.00 Cum. Conv. 2nd	211.39f	217.70g	4.00	
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	9.16	8.59i	2.50	49
Flintkote Co. $4 Cum.	81.91	87.68	4.00	
Robert Gair Co., Inc. 6% Cum.	18.01	15.97	1.20	17½
International Paper Co. $4 Cum.	236.51	245.85i	4.00	
Johns-Manville $3.50 Cum.	128.81	175.15	3.50	
Kimberly Clark Corp. 4½% Cum.	70.03	73.34	4.50	
Kimberly Clark Corp. 4% Cum. Conv. 2nd	95.88	100.73i	4.00	92½
MacAndrews & Forbes 6% Cum.	62.20	59.89	6.00	
Mead Corp. 4¼% Cum.	81.56	79.68i	4.25	
Mead Corp. 4% Cum. Conv. 2nd	53.34	51.75i	2.00	
Paraffine Cos. Inc. 4% Cum. Conv.	152.76a	158.96	4.00	100½
Rayonier Inc. $2 Cum.	13.58	16.09	2.00	32⅛
St. Regis Paper Co. 4.40% 1st A	76.93	85.00	4.40	85½
Scott Paper Co. $3.40 Cum.	43.95	54.31	3.40	88⅛
U. S. Gypsum Co. 7% Cum.	211.34	300.59	7.00	169
United Wallpaper Inc. 4% Cum. Conv.	(d)1.35a		2.00	
West Virginia Pulp & Paper 4½% Cum.	75.75c	78.49g	4.50	
Common Stocks				
APW Products Co.	$1.24	$1.46i	$0.25	4⅝
American Writing Paper Corp.	1.61	0.02	0.25	5⅜
Armstrong Cork Co.	6.41	7.17i	2.60	50½
Celotex Corp.	6.59c	7.15g	2.00	25⅝
Certain-Teed Prods. Corp.	3.75	3.99	0.90	14¼
Champion Paper & Fibre	5.57f		2.00	24
Congoleum Nairn Co.	4.55	5.12i	2.00	34
Container Corp. of America	10.09	9.54	2.00e	36¾
Crown Zellerbach	6.81f	6.53g	2.00	27⅜
Dixie Cup Co.	5.87	5.37i	1.00	30
Flintkote Co.	6.27	6.28	2.50	31⅜
Robert Gair Co. Inc.	2.83	2.49	0.40	6⅞
Great Northern Paper Co.	4.56	4.44i	2.40	
International Paper Co.	15.02	15.62i	4.50	57½
Johns-Manville Corp.	3.17	4.28	1.40	38½
Kimberly-Clark Corp.	4.29	4.52i	1.40	19¾
MacAndrews & Forbes Co.	3.68	3.53	2.50	37
Marathon Corp.	3.39c	3.93g	1.40	22¾
Mead Corp.	7.33	7.10i	2.00	16½
National Container Corp.	4.13	3.11i	1.20	10⅞
Paraffine Cos. Inc.	2.40a	2.50	1.20	22⅛
Rayonier, Inc.	7.30	8.88	2.00	29½
Ruberoid Co.	10.88	12.13i	2.75	61
St. Regis Paper Co.	2.66	2.86	0.80	10
Scott Paper Co.	3.02	3.79	2.50	
Sutherland Paper Co.	6.87	6.43	2.50	40¼
Taggart Corp.	1.29		0.60	
Union Bag & Paper Corp.	7.93	8.13	3.00	31
United Board & Carton	4.95b	3.39h	1.00	
U. S. Gypsum Co.	10.00	14.36	6.00	104½
United Wallpaper	(d)0.11a		—	23⅞
West Virginia Pulp & Paper	11.40c	11.56g	4.00	42¾

(a) Year ended 6/30/48
(b) Year ended 5/30/48
(c) Year ended 10/31/47
(d) Deficit
(e) Plus extras
(f) Year ended 4/30/48
(g) 12 months to approximately 7/31/48
(h) 12 months to 8/21/48
(i) 12 months to approximately 6/30/48
(*) Pro forma

Dividends Declared

Scott Paper Co. Consolidated net earnings for the nine months ended September 25, 1948, after provision for preferred dividends, were $2,550,103, equivalent to $2.92 per common share based on the 871,847 shares outstanding. This compares with $1,876,874 for the corresponding period ended September 27, 1947, equivalent to $2.15 per common share. Net sales for the nine months period are reported as $53,153,594 as compared to $41,196,563 for the corresponding period of last year. In October the company received final payment of $1,905,227, making a total of $3,905,227 accepted by it in full settlement of its claim against the insurance company for property damage, expenditures and production losses resulting from the accident to the towel machine at Chester on September 11, 1946. On this basis, the company's published net income for the years 1946 and 1947 remains unchanged. No portion of the insurance proceeds will be included in its income for the year 1948.

Rolland Paper Co., Ltd.'s decision to omit the regular quarterly dividend of 15 cents per share on the common stock usually payable about November 15 is understood to be based on the substantial expenditures involved by the firm's expansion program and a drop in export shipments, with the expenditures already made or to be made in the company's modernization and expansion program expected to result in higher production and lower operating costs in future. The 15 cents per share quarterly dividend rate has been in force from February, 1940, to and including the payment on August 16, 1948, and extra payments of 15 cents per share had been made in November, 1940, February, 1942, and in February of the present year. Net earnings of $330,734 reported for the year ended December 31, 1947, were the highest in the firm's record and equivalent to $4.31 per share common after regular preferred dividends.

Rolland Paper Co., Ltd., of Canada has declared a dividend of $1.06½ per share on the preferred stock of the company, payable on December 15 to shareholders of record on December 1, 1948.

National Gypsum Co. — Net income for the three months ended September 30 was $2,208,011. This was equal, after allowance for preferred dividends, to 99 cents a share on 2,112,336 common shares outstanding. In the third quarter of 1947, the company reported a net profit of $1,201,314, equal to 65 cents a share on 1,679,869 common shares then outstanding. Earnings for the first nine months of 1948 rose to $5,545,548, equal to $2.48 cents a share, compared with $3,741,760, or $2.04 a share, in the corresponding period last year. Gross sales in the 1948 three-month period climbed to $17,956,554 from $13,087,261 in the same quarter last year. Sales in the first nine months of this year totaled $49,852,860, contrasted to $37,085,730 a year earlier.

Canadian Power & Paper Investments profit for the year ended July 31, 1948, amounted to $1,093 or 2c per share of preferred stock, as compared with $1,101 for the preceding year. Total revenue showed a slight increase at $54,647 as compared with $50,694. During the year debentures to the principal amount of $79,100 are purchased leaving $494,000 outstanding at the year-end. Cash of $25,386, as of July 31, 1948 was down from $89,223 at the previous year-end while investments of $3,883,095 compared with $3,893,133.

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Niagara Alkali Company pioneered the electro-chemical industry in America. Niagara continues to extend the know-how gained in this pioneering work to the many users of Niagara Caustic Soda, Caustic Potash, Carbonate of Potash, EBG Liquid Chlorine, Paradichlorobenzene and Niagathal (Tetrachloro Phthalic Anhydride). May we serve you?

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60 East 42nd Street, New York 17, N.Y.

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Australian Notes

Imports of newsprint during July totalled 4,164 tons (rolls, 3,865 tons, and sheets, 299 tons), a gain of 2,692 tons on the previous month, but a loss of 14,752 tons on July of the previous year.

Other printing papers imported during the month were: (all in hundredweights of 112-lb.)—Antique, 364 (U.K. 321, Norway 43); imitation art, 3,347 (U.K. 1,938, Sweden 1,246, Finland 163); machine process coated, 1,594 (Sweden 1,415, U.K. 179); other coated papers, 1,906 (U.K. 1,721, Norway 98, Sweden 87); offset, 126 (Sweden 66, Norway, 40, U.K. 20); lithographic, machine glazed, 2,967 (Sweden 1,423, Norway 903, U.K. 341, Finland 300); other machine glazed, 7,541 (Norway 5,248, Sweden 1,522, Austria 569, Finland 202); esparto, one-side calendered, 50 (all from U.K.); other one-sided calendered, 10,345 (Norway 9,761, Spain 251, U.K. 231, Sweden 102); two-sided super calendered, 2.354 (Sweden 2,024, Finland 330); machine finished, 715 (U.K. 368, Norway 206, Finland 141); magazine, 19,989 (Norway 9,013, Finland 5,197, Sweden 3,203, U.K. 2,256, Belgium 268, Austria 42, Canada 5, U.S.A. 5); glazed imitation parchment, 522 (Sweden 308, U.K. 214) and other printing papers, 2,883 (Sweden 1,221, U.K. 780, Norway 596, Finland 286). It will be seen that the total amount received from the United States was only five hundredweight, and this was valued at £29 ($139 at par rate of exchange).

* * *

It is reported that successful Australian-United Kingdom-Newfoundland negotiations should mean the securing of an additional 27,000 tons of newsprint for Australia. The first shipment is expected from London shortly.

* * *

Sir Keith Murdoch, who has just returned from a visit to New Zealand, announces that capital of £800,000 has been provided by Australian interests for the extensive development of the kraft pulp mill to be established by New Zealand Forest Products, Ltd. Australian mills have agreed to take half of the output of the company, with a minimum of 12,500 tons of kraft paper (valued at between £300,000 and £400,000) a year.

* * *

Registered recently: Nettl Paper Convertors, Ltd., capital £100,000; directors: A. Nettl, L. Rubenstein, A. Dowling and G. Beattie. Object—to purchase the interest of A. Nettl in the paper manufacturing business of Legy Co., West Melbourne . . . Cardboard Carton Manufacturers Pty., Ltd., capital £25,000; subscribers: J. Evans, A. Robinson, C. Gates and N. Jacobs. Manufacturer of cardboard cartons and containers. Works, Sydney . . . Smith Brothers Cartons Pty., Ltd., capital £5,000; subscribers: H. R., C. F., A. C. and A. K. Smith. Manufacturer of articles from pulp, paper and cardboard etc. Works, Sydney.

* * *

Australian Paper Manufacturers Ltd., report a record net profit of £248,812 for the financial year ended June 30 last. Dividend remains unchanged at six percent. Consolidated assets have risen by £351,253 to £7,510,408 ($36,049,958 at par).

Associated Pulp & Paper Pty. Ltd., reports a net profit of £96,492 for the year ended April 30, compared with the £100,645 of the previous 12 months. Dividend remains steady at six percent. Directors report that the tonnage of paper produced was again greater than the previous year.

New Zealand Forest Products report a record profit of £56,419 for the year ended March 31st, 1948. Profit is to be carried forward, raising the amount to the credit of the appropriation account to £272,077.

* * *

Concern at the use by Government departments of large quantities of paper was recently expressed by delegates to the 24th annual convention of the Printing & Allied Trades Employers' Federation of Australia. Complaints were made that printers had to use expensive imported paper for school text books and other lines while the Government used locally-made paper.

* * *

Professor George Jayme, one time of Darmstadt University, where he was director of the Institute for Cellulose Chemistry, is now in Australia advising paper manufacturers on the use of eucalyptus cellulose. The professor, who spent two-and-one-half years in England, and who, in pre-war days, spent ten years with the Kipawa plant in Canada, says that it is believed that the hemicellulose from eucalyptus can be used in the production of chemical pulp for newsprint. (At the moment only one variety of eucalyptus is used in Australian pulp and paper manufacture).

* * *

T. Bruce Fallows, a Canadian newsprint man representing a Powell River group of six mills, is at present touring Australia. He is adjusting details of a ten-year contract under which this group is prepared to provide Australia with 130,000 tons of paper, but the present exchange complication prevents more than 45,000 tons being imported next year. This amount would cost about £2,000,000 (about $6,000,000 at the present rate of exchange).

S. L. Kessell, managing director of Australian Newsprint Mills, Ltd., has just returned from a world tour (embracing the United States, British Columbia, Canada, England and Sweden) completing arrangements for a large expansion program at his company's Tasmanian mills.

Moved to Jersey City

NEW YORK—The Charles C. Phelps Co., has moved its offices from 39 Cortlandt street, to larger space in the First National Bank Building, 1 Exchange Place, Jersey City 2, N. J., retaining the present New York telephone number.

The firm represents W. H. Nicholson & Co., maker of steam traps and multiport valves; Ellison Draft Gage Co.; Leavitt Machine Co., maker of Dexter valve reseating machines; and Perfecting Service Co., manufacturer of rotary unions for admitting steam or water to rotating cylinders. C. C. Phelps, H. B. Villiers, J. F. Ryan, P. A. Ivone and B. A. Findlow are the sales engineers covering the Metropolitan area and John Brown, with headquarters at Syracuse, covers central and northern New York State.

Laminating Advance

BEDFORD, Ohio—A new process for laminating polyethylene film to paper has been developed by Floyd A. Holes Co., of this city. The laminate is a moisture barrier intended for bulk packaging of hydroscopic materials. The laminations can be made using papers ranging from tissue to a medium weight board and can be heat-sealed on ordinary bar or roller type heat-sealing devices.

Murco Vets Form Club

WAUSAU, Wis.—Following a dinner meeting on October 14 sponsored by the D. J. Murray Mfg. Co. for employes and officers with over 25 years of service with the company, the Murco Quarter-Century Club was organized with nine members.

"Package" Power for India

SOUTH PHILADELPHIA — "Package" power plants made by the Steam Division of the Westinghouse Electric Co. will supply the electricity for a new paper mill in the Central Provinces of India.

Avoset In New Home

PHILADELPHIA — The Avoset Co., division of the Smith, Kline & French Laboratories is now at 1530 Spring Garden street. The telephone number is LOcust 4-2400.

Alloy's Tait to Atlanta

LINDEN, N. J.—The Alloy Steel Products Co., has named E. P. Tait southeast district sales engineer with headquarters at 333 Candler Building, Atlanta.

Meetings

ASSOCIATION EXECUTIVES: Please send us your meeting dates and locations for this column as far in advance as possible. No charge for publication.

NOVEMBER 9-10: Pacific Coast Div'n., National Ass'n. of Waste Material Dealers, Inc., Palace Hotel, San Francisco.

NOVEMBER 10: American Society for Testing Materials, Philadelphia District. Franklin Institute.

NOVEMBER 16: American Society for Testing Materials, Cleveland District. Cleveland Engineering Society.

NOVEMBER 18-19: Production Conference, American Management Ass'n. Hotel Drake, Chicago.

NOVEMBER 19: American Society for Testing Materials, New England District. Hotel Sheraton, Worcester, Mass.

NOVEMBER 29: American Society for Testing Materials, Pittsburgh District, Mellon Institute.

NOVEMBER 29–DECEMBER 4: National Exposition of Power and Mechanized Engineering, Grand Central Palace, New York City.

DECEMBER 2-3: Insurance Conference, American Management Ass'n. Hotel Drake, Chicago.

1949

JANUARY 13: American Society for Testing Materials, Philadelphia District. Franklin Institute.

JANUARY 20-21: Finance Conference, American Management Ass'n. Hotel Pennsylvania, New York.

FEBRUARY 3: American Society for Testing Materials, New York District, Engineering Society Building.

FEBRUARY 10: American Society for Testing Materials, Philadelphia District. McAllister's, 1811 Spring Garden Street.

FEBRUARY 14-16: Personnel Conference, American Management Ass'n. Palmer House, Chicago.

FEBRUARY 20-25: Annual Convention, American Paper & Pulp Ass'n. Hotel Waldorf-Astoria, New York. For details, write to E. W. Tinker, Executive Secretary, 122 East Forty-Second Street, New York 17, N. Y.

FEBRUARY 22: SAPI Luncheon, Hotel Waldorf-Astoria. For details, write to E. G. Amos, Secretary-Treasurer, Salesmen's Ass'n. of the Paper Industry, 122 East Forty-Second Street, New York 17, N. Y.

FEBRUARY 28- MARCH 4: Spring Meeting and A. S. T. M. Committee Week, American Society for Testing Materials. Edgewater Beach Hotel, Chicago.

MARCH 17-18: Marketing Conference,American Management Ass'n. Hotel Pennsylvania, New York.

MARCH 22: American Society for Testing Materials, Philadelphia District. Franklin Institute.

APRIL 14-15: Production Conference, American Management Ass'n. Hotel Pennsylvania, New York.

MAY 10-12: Packaging Conference, American Management Ass'n. Auditorium, Atlantic City, N. J.

MAY 26-27: Insurance Conference, American Management Ass'n. Hotel New Yorker, New York.

JUNE 8-9: General Management Conference, American Management Ass'n. Hotel Pennsylvania, New York.

JUNE 27-JULY 1: Annual Meeting, American Society for Testing Materials. Chalfonte-Haddon Hotel, Atlantic City, N. J.

AMERICAN PAPER AND PULP ASSOCIATION'S PRODUCTION RATIO REPORT*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1948		Corresponding Weeks—1947	
September 18	97.3	September 20	108.6
September 25	98.4	September 27	107.0
October 2	98.6	October 4	109.5
October 9	98.4	October 11	108.4
October 16 (Revised)	99.9	October 18	108.3
October 23	**100.3	October 25	110.2

COMPARATIVE MONTHLY SUMMARIES

1947						1948	
Jan.	102.1	May	106.2	Oct.	109.5	Jan.	100.3
Feb.	105.9	June	106.2	Nov.	109.3	Feb.	99.8
Mar.	106.1	July	95.5	Dec.	101.5	Mar.	100.8
Apr.	105.1	Aug.	104.2			Apr.	100.8
		Sept.	102.0	Year Avg.	104.3	May	100.5
						June	‡94.5
						July	‡88.1
						Aug.	‡96.8
						Sept.	‡91.8

‡ Preliminary Ratios.

COMPARATIVE YEARLY SUMMARIES

	1941	1942	1943	1944	1945	1946	1947	1948
Year to Date	96.2	92.0	88.5	88.3	88.9	101.0	103.9	*97.1*
Year Average	97.4	90.4	87.8	88.1	89.4	101.1	104.3	

** Indicates 1948 volume of 180,341 tons—Comparable week 1947—174,648 tons.

PAPERBOARD OPERATION RATIOS†

Current Weeks—1948		Corresponding Weeks—1947	
September 18	97	September 20	101
September 25	94	September 27	102
October 2	96	October 4	100
October 9	96	October 11	102
October 16	97	October 18	101
October 23	*95*	October 25	101

Year	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1947	99	103	101	100	101	101	90	99	96	101	99	89	98
1948	99	100	102	102	100	94	81	92	*91*				

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing nwsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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Phila. 6, Pa.

Obituary

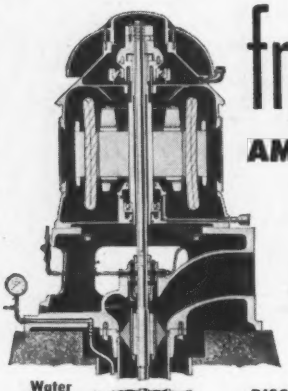
David F. Hayes, 70, who was affiliated with the Lawless Paper Mills for more than 35 years, died on October 25 in Rochester, N. Y., after a brief illness. Mr. Hayes served successively as superintendent of Lawless Mills in Penfield, Scottsville and East Rochester. A member of the American Pulp & Paper Mill Superintendents Ass'n., he was active in a variety of community affairs.

William T. Sibley, 79, former sales manager of the Alling & Cory Paper Co., in Buffalo, died on October 22 after an illness of several months. Mr. Sibley had been associated with the firm for more than 30 years prior to his retirement. For 12 years before coming to Buffalo in 1904, Mr. Sibley was a salesman for the Carter-Rice Paper Co.

Arthur J. Seymour, 56, a paper handler with the Oberly & Newell Co., New York City, died at his home in Lake Hopatcong, N. J., on October 25. Surviving him are his widow, Mrs. Catherine Seymour; a daughter, a sister and a brother.

Mrs. Mary Adelaide Vaughn Lowe, 89, chairman of the board of the Lowe Paper Co., Ridgefield, N. J., died on October 25 at her home in Tenafly, N. J. Mrs. Lowe succeeded her husband, Herbert George Lowe, as chairman of the board when he died ten years ago. Surviving are two sons, Donald V. Lowe and Malcomb B. Lowe, and a brother, William Ambrose Vaughn.

George H. Carter, 74, the U. S. Public Printer from 1921 to 1934, died at his home in New York on October 24. On his retirement in 1934, he went to Philadelphia, where he joined the Lanston Monotype Machine Co.



from top to bottom

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MOTOR—Enclosed type keeps moisture and dirt out of working parts. Hollow shaft design simplifies installation and adjustment of pump rotating element at top of motor. Available also for engine or dual drive with right angle gear unit.

DISCHARGE HEAD—Deep bronze packing box, grease sealed, bronze seal rings and gland, and connections for vent to atmosphere and prelubrication line . . . designed for high pressure with minimum leakage. Top line shaft bearing eliminates whipping through packing box.

COLUMN—Full weight steel pipe in standard 10′ lengths. Flanged construction for sizes over 7″. Bronze bearing housings and guides at each joint. Water lubricated, fluted rubber bearings at non-corrosive wearing surfaces of shaft.

BOWL ASSEMBLY—Flanged upper and lower bearings, provided with renewable bronze bearing bushings. Flanged bowls, with uniform and smooth water passages, and renewable bronze wearing rings and bearings. Bronze enclosed impellers have uniform, hand finished water passages. Given a final machining after assembly on shaft to insure correct running clearances and rotative balance. Stainless steel pump shaft with stainless steel locking device to firmly position each impeller to shaft.

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TAPPI Engineering

(Continued from page 14)

R. G., Paper & Ind. Appliances; Goodrich, Albert S., Hammermill Paper Co.; Grimnes, S. H., BFD Div. of Diamond Match Co.; Guell, M. R., Gaylord Container Corp.; Gunst, Glenn A., West Va. Pulp & Paper Co.

Hage, Gerald S., River Raisin Paper Co.; Hall, John H., De Laval Steam Turbine Co.; Ham, Merrill T., Hollingsworth & Whitney Co.; Hutton, Frank E., Babcock & Wilcox Co.

Ingraham, Harold G., Bird Machine Co.

Jacobi, E. C., Sandy Hill Iron & Brass Works; Jacobs, M., Chas. T. Main, Inc.; Janson, R. H., Rhinelander Paper Co.; Jerardi, P. J., Black-Clawson; Johnson, Alvin H., Alvin H. Johnson & Co.; Johnson, A. L., Int. Paper Co.; Johnston, H. Wyatt, Sutherland Refiner, Ltd.; Johnson, Russ., Kimberly, Clark; Johnstone, R. G., E. B. Eddy Co.; Jones, K. H., J. O. Ross Engineering Co.

Kahn, Jas. M., Infilco, Inc.; Kaluta, John, BFD Div. of Diamond Match; Kennedy, E. H., Combustion Engr. Co., Inc.; Kettes, Thomas M., Canadian Stebbins Eng.; Kitson, Walter R., Jr., Oswego Falls Corp.; Klykkon, Nils, Sandy Hill Iron & Brass; Knapp, George W., General Electric Co.; Koerner, C. L., Marathon Corp.; Koerwitz, Herman H., Marathon Corp.; Korcheski, Wm. B., T. A. Burton Co.; Kosicki, William A., Shipbldg. & Dry Dock Co.; Koster, H. A., Westinghouse Elec. Corp.; Krancher, Chas. G., Ball Bros. Co.; Krause, A., Rust Engineering Co.; Kurlish, Wm., General Elec.

Lanford, V. L., Sonoco Products; Leonhard, Albert T., Paterson Parchment Paper; Lukemire, Edward L., The Dicalite Co.; Lyall, John D., Armstrong Cork Co.

McCavour, Sam, Great Lakes Paper Co.; McCully, Robert C., International Paper Co.; McGinn, E. P., Paper Trade Journal; McGraw, W. M., General Electric Co.; McInerney, H. O., Price Bros. & Co.; McKenzie, W. A., Simpson Logging Co.; McPherson, John A., Mosinee Paper Mills Co.; McWilliams, John, Byron Weston Co.; MacArthur, John A., Stadler Hurter Co.; MacBain, D. K., BFD Div., Diamond Match Co.; MacDonald, J. T., Provincial Paper, Ltd.; MacDonald, R. G., TAPPI; MacKenzie, K. J., Eastman Kodak Co.; Macklem, C. E., Beloit Iron Works; MacSwain, S. R., Mosinee Paper Mills Co.; Magnus, Carl, Self; Magnuson, A. L., Kelco Co.; Maxson, John E., Stebbins Engineering Co.; Mead, Fred B., Westinghouse Elec. Corp.; Meakin, H. Wells, J. E. Sirrine Co.; Melin, R. H., J. O. Ross Engineering Corp.; Merriss, Bernard L., The Beckett Paper Co.; Metcalfe, W. K., J. O. Ross Engr. Corp.; Meyers, S. E., S. E. Meyers; Millard, L. O., Link Belt Co.; Minser, John A., Crane Co.; Montgomery, A. E., J. O. Ross Engr. Corp.; Moon, D. G., J. E. Sirrine Co.; Moore, Harry,

(Continued on page 34)

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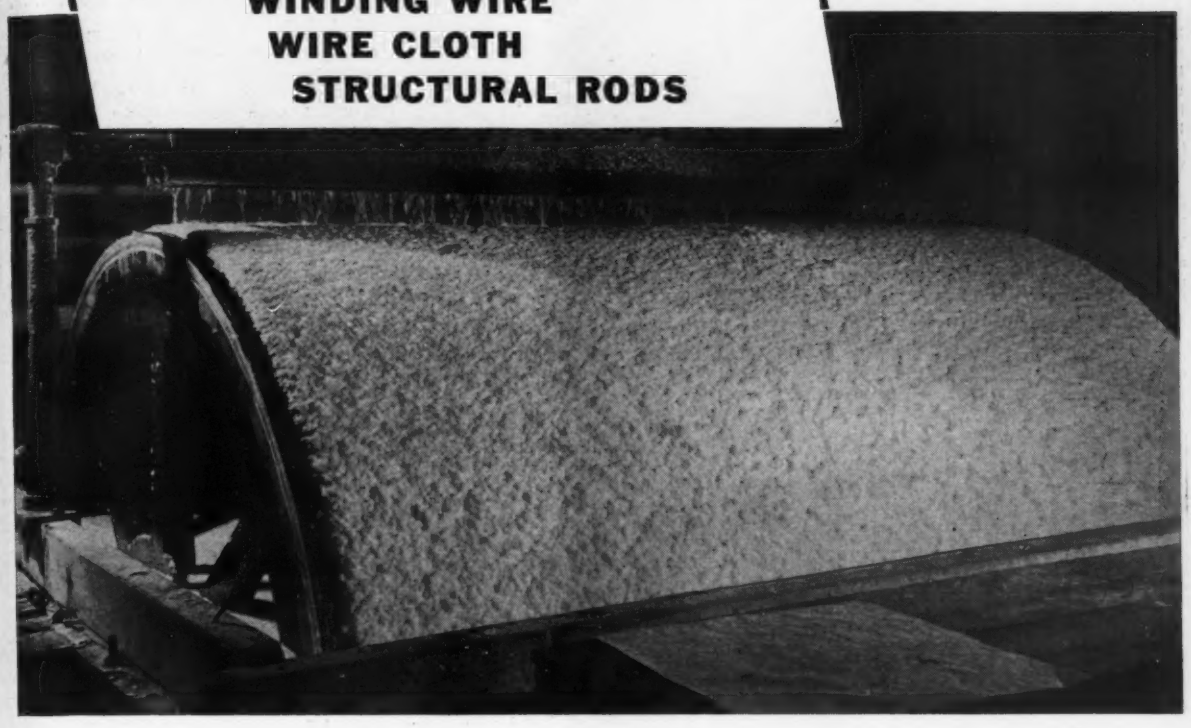

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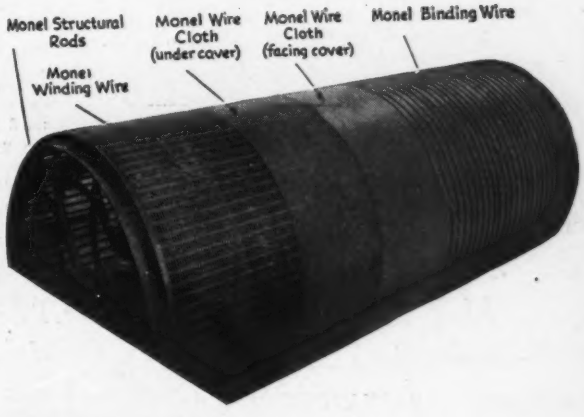

MONEL...for Minimum Maintenance

TAPPI Engineering

(Continued from page 32)

Beloit Iron Works; Moore, Jamison, Union Bag & Paper Corp.; Morden, R. Burke, Morden Machines Company; Morgan, John Wm., Rust Engineering Company; Morrison, H. A., Oliver United Filters, Inc.; Mortenson, A. O., Florida Pulp & Paper Co.; Moss, Dr. L. A., Whiting-Plover Paper Co.; Murphy, Earl K., Westinghouse Elec. Corp.; Murray, W. A., Canadian Westinghouse Co.

Nason, H. E., Westinghouse Elec. Corp.; Nelson, E. C., Gilbert Paper Co.; Nelson, Roy E., Thilmany Pulp & Paper Co.; Nelson, W. R., Westinghouse Elec. Corp.; Nesbitt, W. P., Howard Smith Paper Mills; Neuenfeldt, K. C., Hammermill Paper Co.; Niberger, Bengt, Castle & Overton, Inc.; Noble, John H., Improved Paper Machine Co.

Oakleaf, E. J., Crossett Paper Mills; Obenshain, Noel, W. Va. Pulp & Paper Company; Olmstead, Edwin H., Eaton-Dikeman Co.; Olsen, Franklyn, Paper Trade Journal; Orchard, W. M., Ontario Paper Co., Ltd.; Orr, Carleton E., Stebbins Eng. & Mfg. Co.; Overbagh, John S., Fraser Paper Ltd.; Owens, Vincent P., Combustion Engineering Co.; Oxford, C. E., C. M. Gueest & Sons.

Pallister, Ernest G., Provincial Paper Ltd.; Paret, Louis F., Westinghouse Elec. Corp.; Parker, Geo. T., Jr., Johns-Manville Sales Corp.; Parker, Hubert F., NY & Penn. Co., Inc.; Patch, C. E., Morton C. Tuttle Co.; Peterson, G. A., Rice Barton Corp.; Petrie, R. T., Black-Clawson-Shartle-Dilts; Petzold, H. P., Oxford Miami Paper Co.; Pierce, B. B., Gaylord Container Corp.; Pierce, Edgar M., Alonzo B. Reed Inc.; Platzer, Charles, Pt. Huron Sulphite Paper Co.; Popp, John M., General Electric Co.; Porter, Richard W., Paper Ind. & Paper World; Pringle, Geor. H., The Mead Corp.; Publicover, Lloyd D., Canadian Stebbins Eng. & Mfg.; Putnam, D. H., General Electric Company.

Rand, G. H., Jr., Int. Paper Co.; Raymond, R. W., Missisquoi Corp.; Reichert, J. S., Du Pont; Rice, C. H., Westinghouse; Richter, Johan, A. B. Kamyr; Ries, Henry L., Rhinelander Paper Co.; Riley, Edwin A., Record Foundry & Mach. Co.; Rizzo, A. W., Container Corp. of Am.; Robinson, C. P., Heppenstall Co.; Rogers, Charles N., Sonoco Prod. Co.; Roglitz, Carl, Port Huron Sulphite & Paper; Rohrbaugh, Nevin B., P. H. Glatfelter Co.; Root, Edward M., Dilts Mach. Works; Rowe, Stanford H., Consol. Water Power & Paper.

Sadtler, P. B., Gen. Am. Transp. Corp.; Sanger, Frank M., The Pusey & Jones Corp.; Sargeant, Guy H., Brown Co.; Schuermann, J. S., Cameron Machine Co.; Schnaufer, Martin F., Detroit Sulphite Pulp & Paper Co.; Schilt, Earl A., Zaremba Co.; Schmidt, C. J., J. O. Ross Engrg. Corp.; Schmitz, H. A., A. O. Smith Corp.; Scott, R. P., Ball Bros. Co.; Shaughnessy, J. Brooke, American Wringer Co.; Shaw, Geo. V., Ingersoll Rand Co.; Sherwood, A. L., Sutherland Paper Co.; Simons, L. G., Chas. T. Main, Inc.; Sippola, A. I., Socony Vacuum Oil Co.; Smith, James A., Clark & Vicario Co.; Smith, Ray, Mead Corp.; Snyder, G. L., Lukens Steel Co.; Solvason, Sigurd, G. M. Guest & Sons; Sprau, Wm. J., National Gypsum Co.; Staats, Philip L., Gen. Elec. Co.; Stachel, Earl F., Am. Coating Mills; Stein, T. R., Minn. & Ont. Paper Co.; Stevens, Henry R., The Flintkote Co.; Stoltz, R. R., Westinghouse.

Taft, Caleb S., International Paper; Tate, J. H., Howard Paper Mills, Ind.; Tarbell, Lester J., Bird & Son, Inc.; Taylor, Ruel E., Jr., Flagg, Brackett & Durgin, Inc.; Teeple, Ho. O., Int. Nickel Co.; Thomas, Beau, Stebbins Engr. & Mfg. Co.; Thompson, Laurence P., Personal Prod. Corp.; Thurn, Arthur, Champion Paper & Fiber; Tierney, Thomas D., A. J. Rauh & Co.; Tildes, Carl H., J. E. Rhoads & Sons; Tschudi, Hans, H. Weidmann, Ltd.; Tucker, Edward F., Stebbins Engr. & Mfg.; Turner, Barry M., Int. Paper Co.

Vallandigham, V. V., Keleo Co.; Valley, Elmer E., Provincial Paper Ltd.; Van Nott, J. L., Reliance Elect. & Engrg. Co.; Van Voorhis, Fred S., J. A. Manning Paper Co.; Vebber, Richard J., Stebbins Engr. & Mfg. Co.; Vickery, C. H., E. D. Jones & Sons Co.

Wadleight, Geo. R., Consulting Engineer; Ward, J. J., Jr., Union Bag & Paper Corp.; Wardwell, N. P., Carthage Machine Co.; Warner, John E. A., Robert Gair Co., Inc.; Waymire, W. E., Westinghouse; Weber, H. F. R., Link Belt Co.; Weber, Sam T., Black Clawson; Weiman, George E., Bloomer Bros. Co.; Weiss, Arthur J., Lowe Paper Co.; Werle, Robert R., Jr., The Dicalite Co.; Weston, Harry E., American P. & P. Mill Supts. Assoc.; Whipple, Cash, Beloit Iron Works; White, W. A., Jr., Shartle Bros. Mach. Co.; Williams, Pyam W., Robertson Paper Box Co., Inc.; Wilson, Albert, Pulp & Paper; Wilson, John C., Hammermill Paper Co.; Winningham, O., National Container Corp.; Wright, Carl D., J. E. Rhoads & Sons.

Yocum, Thurston L., E. D. Jones & Sons Co.; Young, Curt A., W. Virginia P. & P. Co.

Zando, Ado A., St. Regis Paper Co.; Ziegenbusch, Carl W., The Mead Corp.; Zinkel, G. A., Container Corp. of America.

Bloomquist, Walter C., General Electric Co.; Brown, W. Jefferson, Westinghouse; Butterfield, C. H., Bagley & Sewall Co.

Califano, Frank L., The Flintkote Co.; Clarke, E. W., Knowlton Brothers; Clarke, C. L., Clark & Vicario Co.; Courneene, James P., Escanaba Paper Co.; Crocker, John W., Sandy Hill Iron & Brass; Calvert, F. V., General Electric; Cash, George H., J. O. Ross Engrg. Co.; Coster, N. W., Soundview Pulp Co.

Davis, Alex P., St. Regis Paper Co.; Davis, Graham, Mason-Neilan Regulator Co.; Dixon, L. S., N. N. S. & D. D. Co.; Durkee, C. L., D. J. Murray Mfg. Co.

Ellis, Buffalo Pumps, Inc.

Fahlgren, Sven, Bird Machine Co.; Forrest, Frank R., Allis Chalmers Mfg. Co.; Foster, F. M., Detroit Sulphite Pulp & Paper Co.

Griffith, R. C., Knowlton Bros., Inc.; Hendrick, Walter G., Hammermill Paper Co.; Hilfrank, W. L., General Electric Co.; Hutchinson, Martin B., Brown-Hutchinson Iron Works; Hutter, J. C., John Inglass Co., Ltd.; Hyer, Allen, Bagley & Sewall Co.; Janett, L. G., J. O. Ross Engrg. Corp.; Jenness, Lyle Co., U. of Maine; Jones, E. M., General Electric Co.; Keleher, John Co., Gould Paper Co.; Stark, D. L., Shartle Bros. Mach. Co.

Hartford, W. G., Ohio Boxboard Co.; Hawkins, G. L., Hammermill Paper; Hellstrom, Arne G., Paper Machinery Ltd.; Hemphill, J. W., Johns Manville Corp.; Herbig, R. O., Reliance Elec. & Engrg. Co.; Hoit, Robert S., Simpson Logging Co.; Holman, Robert C., Bird & Son.

Houston, John C., Jr., Stacom Industries, Inc.; Hrubecky, George, Marathon Corp.

Adamson, Roy V., International Paper Co.; Allen, C. Brigham, Jr., Reliance Electric & Eng. Co.

Bevis, George E., Reliance Electric & Eng. Co.

Clarke, K. H. J., International Nickel Co. of Canada.

Gerbereux, V. De P., Worthington Pump & Machinery Corp., Gorr, W. W., Carnegie-Illinois Steel Corp.; Gruenwald, A., Gruenwald & Niemitz.

Harvie, Ralph A., Canadian (W); Howell, R. P., Fuller Co.

Lockwood, George E., Lockwood Trade Journal Co., Inc.; Long, F. D., Container Corp. of America.

Marstall, Frank, Westinghouse Electric Corp.; McIlveen, Edward E., The Okonite Co.; Mears, R. B., Carnegie-Illinois Steel Corp.; Morse, Herbert G., General Electric Co.

Nicholson, George B., Jr., Dilts Mach. Works.

Rich, John P., Improved Paper Machinery Corp.

Schreiner, Milton A., The Foxboro Co.; Scott, P. B., Syco Mfg. Corp.; Shillum, Raymond J., Brown-Hutchinson Iron Works; Sholl, H. A., Brown Instrument Co.; Sibler, Charles J., West Va. Pulp & Paper Co.; Smith, Harry E., Syco Mfg. Corp.; Snyder, Fred B., Babcock & Wilcox Co.; Spencer, Geo. H., Torrington Co.

Van Kampen, G. R., Red-Ray Mfg. Co., Inc.

Warner, E. E., General Electric Co.; Warner, Sterling O., Chromium Corp. of America; Wells, Arthur S., The Mead Corporation; West, Frederic R., American Industrial Co.; Whittock, Arthur, St. Regis Paper Co.; Winslow, F. W., General Electric Co.; Wood, Harold F., Jr., Heppenstall Co.

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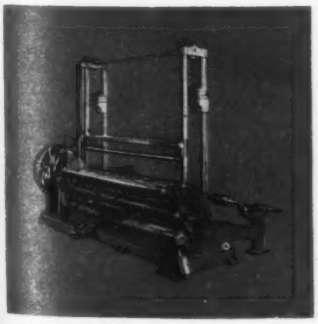

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Fibre Box Ass'n. Meet

(Continued from page 22)

continue to improve the product; promote the use of liners, top and bottom separating pads and other interior packing; develop new uses for fibre boxes and to keep abreast of developments outside of the industry which have a bearing upon the business.

Statistical Report

Alvin A. Newburg, staff member, submitted the statistical picture of the industry for 1948. He stated, "It is expected that fibre box shipments would be 1.1 percent above 1947 and that 1.5 percent more raw materials would be consumed this year than last."

Predicting the future for fibre boxes was the topic of Dr. Charles F. Roos, of the Econometric Institute, Inc.

The second day sessions opened with the reading of a report of the previous day's meeting of the organization's Board of Directors. Three of the 36 directors were represented by officers of their companies, all others were present. F. G. Becker was designated as executive Manager and H. S. Adler as Secretary & Treasurer for repeat terms of office.

Since the Association was formed in 1940, membership dues have been reduced three times. The board voted to continue present dues. It also approved the Association's participation in fibre box inspection program. Because of the importance of traffic subjects the board authorized the president to appoint a Traffic Committee.

The organization's members accepted and approved the actions of it's Board.

Tom Ross of New York, a dean of the industry and one of the founders of Hummel & Downing Co., Milwaukee, and of Hummel-Ross Fibre Corp., Hopewell, Va., was introduced and in acknowledgement told some of the difficulties in securing authorization for the use of the first fibre box in 1902.

A report of timely information of current freight and transportation problems was given by Merritt C. Thiem, traffic manager.

A. W. Luhrs, technical consultant, Washington, reported on the association's dealing with the government on such matters as specifications and requirements. "New Doctrines in Anti-Trust Enforcement" was the subject of Malcolm K. Whyte, counsel for the Association.

The sessions concluded with a period of general discussion of industry problem. Among the matters which were considered were: labor services available to members; the Supreme Court decision of the Bay Ridge Case; the prospect for governmental controls in the event of an emergency; the need for research and a discussion of general developments in government and in industry during the past fifteen years.

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Because it gets extra refining by Gulf's exclusive Alchlor Process, this unmatched turbine oil lasts indefinitely. Gulfcrest Oil has been in service for over 10 years in some of the largest turbines in the U. S. — still shows no evidence of deterioration. Because it does not oxidize sufficiently to form sludge, Gulfcrest Oil helps turbine operators avoid costly shutdowns for cleaning. And Gulfcrest provides positive protection for turbine bearings.

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Butterworth Calender Rolls

Jackpine Research

PINE FALLS, Man.—The Manitoba Paper Co., laboratory is seeking a way to use jackpine for making sulphite and groundwood pulps. At present, the principal pulpwoods being used are spruce and balsam. Jackpine is readily pulped by alkaline cooking, but its high resin content makes it unsuitable for use in the sulphite and groundwood processes which are the methods principally used in Canada. Large stands, together with fast growth, make jackpine a potential source of pulpwood supply if methods for its use can be worked out.

Boston Ass'n Meeting

BOSTON—At the Fall Meeting and Dinner of the Boston Paper Trade Assn., to be held at Hotel Somerset, on November 17, Stewart Anderson, the speaker, will have as his subject, "15,000 Miles in a Modern Covered Wagon," illustraded in color. The Weber Male Quartette will sing. Reception is at 6 p. m. and dinner at 7.

Loan to Sweden OKd

WASHINGTON—Sweden has concluded a $10,000,000 loan agreement with the ECA and the Export-Import Bank for purchase of industrial raw materials, transport equipment and industrial machinery, it was disclosed jointly by the two U. S., agencies late last week.

Kraft Container Board for U. K.

WASHINGTON—An increase of $1,120,000 has been authorized in the procurement program covering kraft container board for the United Kingdom, under ECA, it was announced late last week. The board will be purchased in the U. S.

Industrial Club Speaker

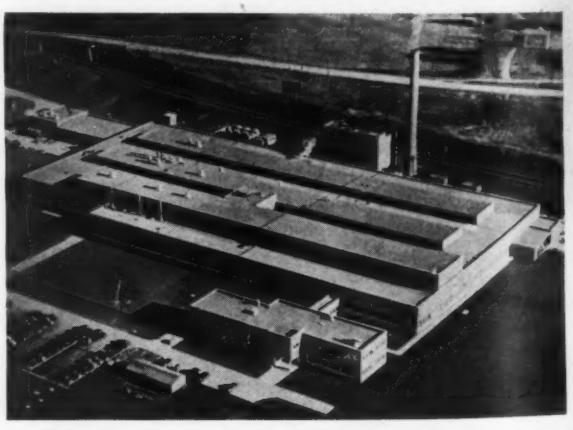
TROY, N. Y.—Harrison F. Dunning, general manager of paper mills at the Scott Paper Co., spoke on "Better Understanding of Top Management's Job" before the Troy Industrial Club on October 21.

Crosby Joins Whiting

HOLYOKE, Mass.—Alfred F. Crosby has joined the sales organization of the Whiting Paper Co., it was reported on October 30. Previously he was with the American Writing Paper Co.

$1,000,000 Box Plant

WEST CAMBRIDGE, Mass.—A permit to erect a $1,000,000 corugated box plant here has been issued to the Robert Gair Co.



LARGE, NEW NON-FERROUS FOUNDRY

New Meadville, Pa., non-ferrous foundry of the National Bearing Division of the American Brake Shoe Co. . . . Latest of six post-war plants erected by the firm. . . . Operations have been discontinued at former plants in Jersey City, N. J., the old plant in Meadville and two in Pittsburgh.

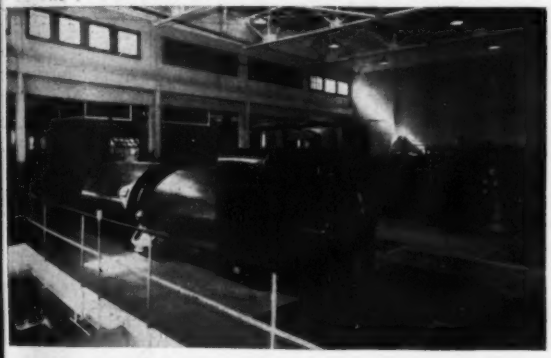
Crossett Paper Mills Expansion

To Increase Paper Production By 140 Tons Per Day

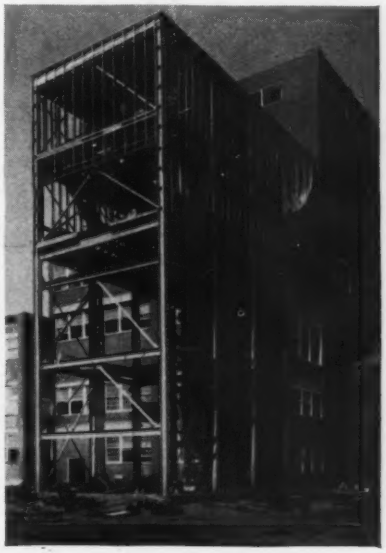
Daily output of the Crossett Paper Mills, Crossett, Ark., will be increased by 140 tons when present expansion is completed. The new 210 inch Fourdrinier which will be in operation in early 1950 will devote its entire output to the production of lightweight kraft papers. The machine which is now in operation will then devote its facilities to the production of heavier grades only.

Before the new Fourdrinier can be operated a great amount of preliminary building has to take place. 1948 has seen much of this work come off the drawing table onto the ground. A new 100,000-pound Babcock & Wilcox boiler has been installed and is in operation; a completely new turbine room, housing among others, the newly acquired 6,000 kilowatt turbine illustrated here. There has been a major addition to the water treating plant to meet the needs of increased paper mill production.

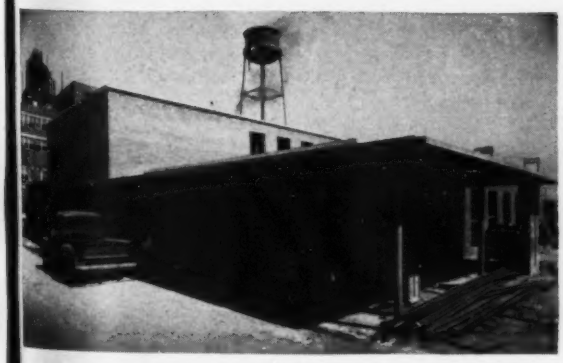
Before this year is out the digester building, which is to house the three additional digesters, will be completed. The digesters themselves will be in full operation by the end of November. The facilities building for paper mill personnel will be completed this year. Before 1949 begins preliminary work for the new machine room will be undertaken. This includes piledriving, as well as concrete and steel erection. The installation will be completed by the end of 1949.



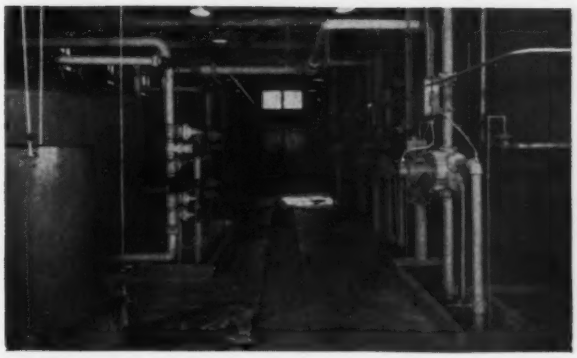
Left — Recently completed turbine room, showing new 6,000 kilowatt turbine.



Right—Extension which will house three new digesters. Digesters will be in operation by the end of this year.



Personnel facilities building which will be completed by the end of this year.



Addition to water treating plant to meet needs of increased production.

INDUSTRIAL DEVELOPMENT

Paper Trade Journal, in this section, makes space available for discussion of technical and operating problems. Space is also available for the presentation of independent studies and research on technical and engineering subjects. Feature stories of paper mills, converting plants and inter-related industries will be included. An invitation is cordially extended to all who are qualified to discuss these subjects. Original manuscripts submitted exclusively to Paper Trade Journal and found suitable for use in this section will be paid for immediately upon acceptance. Submit manuscripts to E. P. McGinn, Industrial Editor.

Atmospheric Durability of Steels Containing Nickel and Copper*

Additional Exposure Data

By N. B. PILLING[1] and W. A. WESLEY[2]

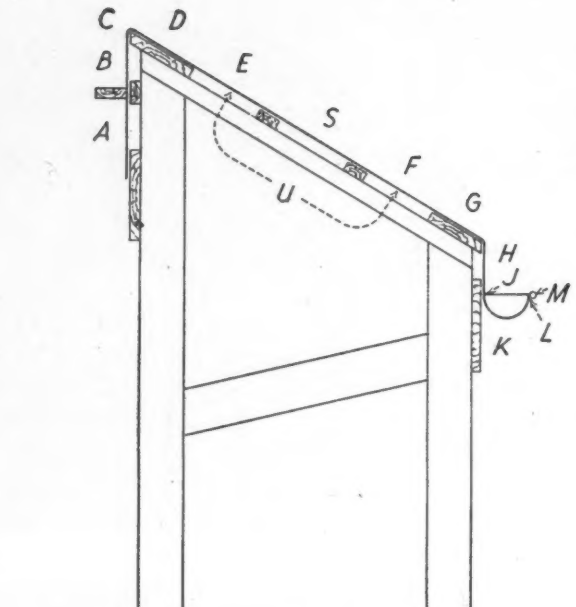


Figure 1. End view of simulated roofing test specimen. (A) Vertical surface, partly sheltered from direct impingement of rain. (B) Vertical surface, boldly exposed to rain. (C) Sharp bend in sheet. (D) Area having lower surface in contact with wood. (E) and (F) Plane inclined surfaces. (G) Area having lower surface in contact with wood. (H) Vertical surface, boldly exposed. (J) Area of water-line attack when trough is full of rain water. (K) Area completely submerged when trough is full of rain water. (L) Area of water-line attack. (M) Trough-bead. (S) Lock seam, one-half soldered, one-half not soldered. (U) Fully sheltered lower surfaces.

Synopsis

The prior publciation (1)[3] on this subject appeared in 1940 and described six series of weathering tests designed to evaluate the duraability of sheet specimens of low-alloy steels containing nickel and copper. The present communication brings up to date the published results of those exposure tests which were continued beyond 1940. In the oldest series, observations at the end of 22 yr. exposure are now made available. In the series in which large sheet specimens simulate some of the conditions encountered in roofing service, the advantage of nickel-copper steels over copper steels is becoming more impressive as the years pass by. Long-continued tests show that it is more significant to compare steels on the basis of how long a time is required to arrive at a given unit weight loss than to compare them on the basis of weight loss suffered in a fixed period of time.

The beneficial effects of nickel upon the weathering resistance of steel increase with increasing nickel content. Addition of copper to a nickel steel improves the life, but the optimum amount is less than the amount of nickel and remains well below 2 per cent even with a 4 per cent nickel content. With long exposure periods, there is evidence that not only phosphorus but also silicon additions to nickel-copper steels have a beneficial effect on behavior in the industrial atmosphere. Effects of manganese and carbon are unimportant in this type of atmosphere.

There was a paucity of data in the literature prior to 1940 on the effect of nickel in the low-alloy range

* Courtesy American Society of Testing Materials.

[1] Director and Assistant Director, respectively, Research Laboratory, The International Nickel Co., Inc., Bayonne, N. J.

[2] The boldface numbers in parentheses refer to the list of references appended to this paper, see p. 8.

Table I.—Weathering Tests Begun in 1925

Type [a]	Chemical Composition, per cent					Life to First Perforation, yr.			
	Nickel	Copper	Manganese	Silicon	Carbon	Rural Atmosphere	Marine Atmosphere	Moderate Industrial Atmosphere	Heavy Industrial Atmosphere
Ingot iron	...	...	0.21	0.03	0.04	11	1.5	1.5	1.5
Copper steel (commercial)	...	0.17	...	...	0.07	14.5	1.5	3.0	2.1
2 per cent nickel-copper steel	1.39	0.61	0.36	0.14	0.07	14.5	over 5	4	3.2
4 per cent nickel-copper steel	2.76	1.18	0.22	0.08	0.11	over 17.5	over 5	6	10
4 per cent nickel-copper steel	2.8	1.2	...	...	0.1	over 17.5	over 5	10	14.5
6 per cent nickel-copper steel	4.2	1.8	0.38	0.13	0.08	over 22.5	5	8	over 20.7
8 per cent nickel-copper steel	5.42	2.36	0.40	0.14	0.08	over 22.5	over 5	18.5	over 20.7
10 per cent nickel-copper steel	6.95	3.03	0.36	0,14	0.18	over 22.5	over 5	8 [b]	over 20.7
10 per cent copper-nickel steel	3.0	6.71	0.40	0.18	0.05	over 22.5	3.5	5.5	13

[a] Thickness of specimens, 0.020 in.
[b] Failed by cracking.

TABLE II.—ANALYSIS OF MATERIALS IN SIMULATED ROOFING TESTS

Type of Steel	Analysis, per cent						
	Nickel	Copper	Manganese	Silicon	Carbon	Phosphorus	Sulphur
Commercial:							
Bessemer steel		0.008	0.40	0.005	0.095	0.111	0.059
Ingot iron		0.06	0.02	0.001	0.015	0.008	0.026
Open-hearth copper steel		0.200	0.39	0.005	0.017	0.006	0.018
Rephosphorized open-hearth copper steel		0.252	0.49	0.005	0.065	0.052	0.022
Bessemer copper steel		0.212	0.40	0.018	0.100	0.112	0.059
Copper-molybdenum iron [a]		0.46	0.12	0.002	0.009	0.015	0.026
Experimental:							
2% nickel steel	1.96	0.03	0.14	0.14	0.06	0.013	0.028
1% nickel, 1% copper	1.05	0.87	0.17	0.13	0.05	0.014	0.031
1.5% nickel, 1% copper	1.58	0.86	0.32	0.20	0.05	0.043	0.068
2% nickel, 1% copper	1.77	0.93	0.13	0.13	0.05	0.012	0.030
1% nickel, 2% copper	1.24	2.23	0.39	0.63	0.08	0.017	0.033
2% nickel, 2% copper	2.16	1.97	0.28	0.52	0.06	0.018	0.005
3% nickel, 1% copper	3.12	1.14	0.20	0.21	0.08	0.015	0.009
3% nickel, 1.3% copper	2.82	1.30	0.14	0.41	0.06	0.015	0.027
3% nickel, 2% copper	2.78	1.83	0.27	0.20	0.06	0.013	0.008
4.4% nickel, 2% copper	4.40	2.05	0.24	0.20	0.11	0.019	0.008
5.5% nickel, 1.3% copper	5.53	1.31	0.17	0.15	0.08	0.012	0.007
6.4% nickel, 1% copper	6.35	1.06	0.16	0.31	0.08		
6.4% nickel, 2% copper	6.40	2.12	0.13	0.12	0.11	0.014	0.011

[a] Contains molybdenum, 0.09 per cent.

TABLE III.—SIMULATED ROOFING TESTS

Time of initial failure at different areas of each specimen. Blank spaces mean no failure at time of last inspection. Letters refer to areas designated in Fig. 1. Results show life in months. Average initial thickness of sheets was 0.033 in.

Type of Steel	Rural Atmosphere					Marine Atmosphere [a]					Industrial Atmosphere					Sulphurous Atmosphere				
	A	B	C to G	K	J and L	A	B	C to G	K	J and L	A	B	C to G	K	J and L	A	B	C to G	K	J and L
Bessemer 0.01% Cu, 0.11% P	74	119	62	15	25	15 [b]	15 [b]	15 [b]	15 [b]	15 [b]	18	18	25	12	12	12	12	12	12	12
Ingot iron 0.06% Cu, 0.01% P				62	74	25	61		15	15	130	130	178	29	25	42	58	34	22	12
Open-hearth copper, 0.20% Cu, 0.01% P				25	74	37	61		25	25	130	130	178	25	25	58	58	58	22	12
Rephosphorized open-hearth copper, 0.25% Cu, 0.05% P				62	94	25			15	15	130	130		29	26	58	73	84	34	22
Bessemer copper, 0.21% Cu, 0.11% P				62	133	25	61		25	25	136	142		38	38	73	73	84	34	12
Copper-molybdenum iron, 0.46% Cu, 0.01% P				62	94	25			15	15	136	136		29	29	58	73	84	22	22
2% Ni, 0% Cu				62	94				25	25	136	168		29	26	58	84	176	34	22
1% Ni, 1% Cu				62	94	61			37	30	136			29	26	73	103		34	22
1.5% Ni, 1% Cu				62	74				37	30	136			29	29	84	103		34	22
2% Ni, 1% Cu				62	74				25	37	136			29	29	73	103		34	22
1% Ni, 2% Cu				62	94				37	30	136	168		29	26	73	84		34	22
2% Ni, 2% Cu				62	94				37	30	136			29	26	84	151		34	22
3% Ni, 1% Cu				62	94				37	37				29	29				34	34
3% Ni, 1.3% Cu				62	94				37	45	168			29	38	113			34	34
3% Ni, 2% Cu				62	94				37	37				38	29				34	34
4.4% Ni, 2% Cu				62	119				37	37				38	29				34	34
5.5% Ni, 1.3% Cu				62	119				37	61				29	26				34	34
6.4% Ni, 1% Cu				62	119				45	45				45	38				42	34
6.4% Ni, 2% Cu				62	119				45	45				38	29				34	34

[a] Testing station destroyed by hurricane at end of 75 months. Last inspection made at 73 months.
[b] Condition indicated that failure occurred in considerably less than 15 months.

TABLE IV.—EFFECTS OF COMPOSITION VARIABLES, 1933 SERIES

Minor Elements, per cent				Life of 0.015-in. Strips, at Bayonne, N. J., Months											
Nickel, per cent				0	0	0	0	.1	1	2	2	2	4	4	4	
Copper, per cent				0	½	1	2	0	½	0	1	2	0	1	2	
Mn	Si	C	P													Average of All Compositions
0.3	0.1	0	0	14	24	31	35	49	37	31	102	59	59	96	72	51
0.6	0.1	0	0	a	15	24	15	26	59	31	37	35	96	144	90	52
1.0	0.1	0	0	35	46	59	28	28	31	37	37	35	96	144	90	52
2.0	0.1	0	0	a	26	52	31	31	63	72	84	a	a	a	a	51
0.3	0.2	0	0	19	26	31	31	28	37	37	44	40	90	102	115	50
0.3	0.5	0	0	24	a	28	31	44	31	a	72	59	115	126	115	65
0.3	1.0	0	0	28	28	31	a	46	35	37	a	59	131	157	157	71
0.3	0.1	0.2	0	a	102	31	31	28	31	40	63	44	72	126	102	61
0.3	0.1	0.3	0	26	63	28	37	59	28	31	72	37	102	128	115	61
0.3	0.1	0.4	0	a	26	31	52	31	115	25	79	44	79	128	102	65
0.3	0.1	0	0.03	a	a	59	52	37	37	44	59	59	72	102	102	62
0.3	0.1	0	0.06	28	a	46	72	96	90	131	46	a	90	115	102	82
0.3	0.1	0	0.09	28	a	59	44	102	37	40	84	171	180	102	102	86
0.3	0.1	0	0.12	44	a	40	28	37	44	40	115	44	126	180	102	73
				..	..	..	..	..	..	..	..	..	..	..	..	..
Average life				27	39.5	39	37	46	48	46	69	57	100	124	105	59

[a] This composition not represented, due to loss or error.

on atmospheric corrosion of steel, but since that time this subject has received increasing attention. Taylorson (2) included a 3½ per cent nickel steel in a study of copper steels exposed at one rural and two industrial atmospheres. Weight loss *versus* time curves were presented for a 5-yr. exposure period, which demonstrated that the advantage of the nickel steel over ¼ per cent copper steels increased with duration of test in accord with the authors' earlier publication (1). In developing an accelerated atmospheric corrosion test, Pray and Gregg (3) obtained weight loss data for 1 and 2 yr. exposure of a series of 0.6 per cent chromium-0.6 per cent copper steels containing various amounts of nickel from 0.7 to 3.0 per cent. Calling the weight loss of a

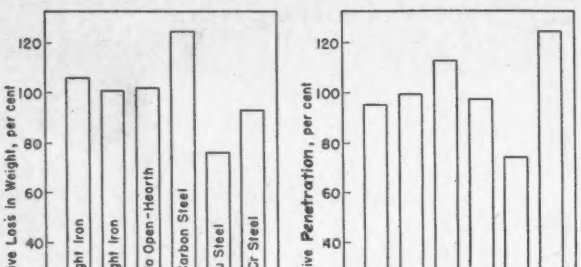


Figure 2. Relative loss of weight and maximum penetration of wrought ferrous materials in soil corrosion test. (From Logan and Romanoff—9).

simple ¼ per cent nickel steel 100 per cent, the complex steels lost weight in 2 yr. to a relative extent of 67 per cent for a .76 per cent nickel content and 48 per cent for the 3 per cent nickel alloy. This spread would undoubtedly have been greater had the weathering tests continued longer.

Data originating with the Carnegie-Illinois Steel Corp. were made available in the form of a curve showing the decrease in loss in weight with increasing nickel content of a set of steels exposed for 5 yr. to an industrial atmosphere (4). The beneficial effect of nickel persisted to the maximum level of nickel content represented, namely, 5 per cent. Some time-corrosion curves for 5 per cent nickel steels are included in a paper by Larrabee (5) from tests covering 8 yr. of exposure in an industrial atmosphere. The shape of these curves confirms an earlier conclusion (1) that the rate of corrosion of nickel steels continues to decrease with lapse of time. These results are further substantiated by another Larrabee publication (6) containing additional loss in weight-time curves for 3½ per cent nickel steels and a nickel-copper steel. As was concluded in the earlier paper by the present authors (1), the advantage of the nickel and nickel-copper steels over plain copper steel was even more pronounced after a few years in a marine atmosphere than in the industrial atmospheres.

A mass of data on low-alloy constructional steels was presented by Copson (7) in developing a theory of the mechanism of rusting of low-alloy steels in the atmosphere. Further results from the same series of exposure tests are to be found in a later paper (8). An important conclusion of this work is that whereas copper and chromium additions to steel were more effective in the industrial than in the marine atmosphere, and manganese was more effective in the marine than in the industrial, nickel additions were effective in lowering corrosion rates at both test sites. Another significant result was the substantiation of the idea that it takes years of exposure for the full benefits of alloying to be realized in the form of reduction of rate of weathering.

TABLE V.—OTHER RESULTS FROM 1933 SERIES

Specimens of the steels from the Roofing Test of Table II were rolled to 0.015 in. gage and were exposed at same time as experimental steels of Table IV. Atmospheric exposure at Bayonne, N. J.

Type of Steel	Life, months
Bessemer 0.01% Cu, 0.11% P	12
Ingot iron 0.06% Cu, 0.01% P	24
Open-hearth copper 0.20% Cu, 0.01% P	35
Rephosphorized open-hearth copper 0.25% Cu, 0.05% P.	42
Bessemer copper 0.21% Cu, 0.11% P	35
Copper-molybdenum iron 0.46% Cu, 0.01% P	31
2% Ni, 0% Cu	59
1% Ni, 1% Cu	46
1.5% Ni, 1% Cu	59
2% Ni, 1% Cu	59
1% Ni, 2% Cu	37
2% Ni, 2% Cu	72
3% Ni, 1% Cu	171
3% Ni, 1.3% Cu	115
3% Ni, 2% Cu	More than 180
4.4% Ni, 2% Cu	171
5.5% Ni, 1.3% Cu	More than 180
6.4% Ni, 1% Cu	More than 180
6.4% Ni, 2% Cu	More than 180

Weathering Tests Begun in 1925

The most recent information on this old exposure of experimental steels is shown in Table I where perforation of sheet by corrosion at a distance of ¼ in. or more from the edges is considered the criterion of failure. Corrosion of the steels containing more than 2 per cent nickel plus copper is so slow at the rural test site in West Virginia that it will be amazing if the site can be maintained intact until all the specimens have failed by corrosion. The passing of the years confirms the conclusion drawn in the previous report (1) that the nickel-copper steels consistently demonstrate sutperiority over the copper steels in all atmospheres represented.

Simulated Roofing Tests

Figure 1 showing a sketch of the roofing test specimens, and Table II giving the analysis of the materials tested, are repeated from the original publication for convenience in studying the results of inspection. In Table III the records begun in 1939 are brought up to date. In recent years the inspections have been made approximately every 12 months.

With the more resistant steels, an appreciable difference in life is becoming evident between the areas of sheet boldly exposed to the rain and area *A* where both surfaces of the sheet are protected from rain. In most cases, failure is occurring sooner at area *A* in accord with other published data (5, 8). The same sort of effect may be operating to lengthen the life of the sloping areas *C* to *G* in comparison with the verticle unsheltered area *B*, with better rinsing by rain of the sloping surfaces. The difference in this case is more pronounced to date in the nickel-copper steels than in the plain copper steels and should prove advantageous to the former in actual roofing service.

Soil Corrosion Tests

Additional data are now available from the soil corrosion studies of the National Bureau of Standards which were begun in 1931. The results obtained on tubular wrought ferrous specimens have been neatly summarized by Logan and Romanoff (9) in Fig. 2, which presents the relative average values of corrosion of all the materials at 10 locations for 2, 5, 7, and 9 yr. interment. It is evident that the nickel-copper steel D (2.47 per cent nickel and 1.08 per cent copper) has continued to be superior to the others, both in respect to weight loss and resistance to pitting.

Some flat plate specimens were later exposed at the same test sites in 1937. In this case, the tightly adherent mill scale on a nickel-copper steel was not removed prior to the burial of the test panels. The mill scale appeared to promote pitting so that the depth of pene-

TABLE VI.—YEARS REQUIRED FOR A WEIGHT LOSS OF 10 G. PER SQ. DM.

Steel	Years	Steel	Years
No. 1	1.6	No. 10	6.3
No. 2	2.7	No. 12	6.6
No. 6	2.8	No. 5	7.1
No. 3	4.2	No. 11	8.6
No. 9	4.3	No. 13	(16)
No. 4	5.1	No. 7	(>>16)
No. 8	5.7		

[a] Pitting Factor = the depth of the deepest pits resulting from corrosion divided by the average penetration as calculated from weight loss.

tration of the nickel-copper steel was about equal to that of the mild and copper steels at the end of 4 yr. of exposure.

Effect of Variables (1933 Series)

This set of exposure tests can now be considered completed since all but four of the original thin strip specimens representing 168 different heats of low-alloy steels have failed by corrosion. The four remaining contain 5 per cent of more total nickel plus copper. Results are presented in Tables IV and V. All the steels of Table IV were prepared in a high-frequency induction furnace using an Armco iron base. The details of preparation and analysis can be found in the earlier report (1).

The rather erratic results to be seen if small groups of specimens close together in Table IV are compared was the subject of a study by H. R. Copson of this laboratory. Although the data are presented as time to disintegration of the edges, the weights of all specimens had been recorded before they were exposed. It was found that there was sufficient correlation between initial weights of specimens and the life data within adjacent groups to conclude definitely that the variation in initial thicknessof these experimentally rolled strips was a major cause of variation in observed life. The other conclusion drawn from this study was that more reproducible and consistent results could have been obtained by determining weight losses with thicker specimens exposed in replicate, which permits removal of rust to detect perforation otherwise invisible.

Effects of Manganese, Silicon, Carbon, and Phosphorus: At the earlier stage of this study, it was concluded (1) that the manganese, silicon, and carbon contents of the steels had no influence upon the life of the specimens in this industrial atmosphere. Exclamation of the averages of horizontal columns in Table IV now tends to confirm the lack of effect of manganese but shows a significant beneficial influence of silicon as well as a faint improvement with carbon. There is no question about the improvement contributed by addition of phosphorus to these nitckel-copper steels.

CHEMICAL ANALYSIS PERCENT—STEEL

Steel	Chemical Analysis, per cent								
	Ni	Cu	Mn	Si	C	P	S	Mo	Cr
No. 1	...	0.06	0.02	0.001	0.02	0.008	0.026	...	...
No. 2	0.03	0.12	0.36	...	0.10	0.037	0.027	...	...
No. 3	...	0.29	0.30	0.01	0.03	0.008	0.053	...	...
No. 4	...	0.60	...	...	0.028	0.011	...	0.094	...
No. 5	0.09	1.25	0.64	0.01	0.20	0.017	0.018	0.30	...
No. 6	...	...	0.52	0.15	0.21	0.017	0.024	0.22	...
No. 7	0.05	0.45	0.33	0.79	0.13	0.15	...	...	1.15
No. 8	0.48	0.50	0.46	0.01	0.12	0.011	0.029	...	0.41
No. 9	1.37	...	0.70	0.91	0.19	0.015	0.025	...	...
No. 10	2.07	...	0.37	...	0.07	0.011	0.029	...	...
No. 11	1.58	0.86	0.32	0.20	0.05	0.045	0.069	...	...
No. 12	1.74	0.09	0.36	0.20	0.125	0.018	0.025	0.24	...
No. 13	5.03	...	0.49	0.30	0.13	0.018	0.019	...	...

Effects of Nickel and Copper: The averages of the vertical columns of Table IV make clear the great increase in life with change in nickel and copper content from left to right. Addition of copper to a nickel steel intcreases its resistance to weathering, but the maximum effect is obtained with something less than 2 per cent copper, even in the presence of 4 per cent nickel.

Atmospheric Tests Started in 1934

Two sets of specimens of this group of alloy constructional steels were removed from the atmospheric exposure racks at Bayonne at the end of 1 and 3 yr., respectively, as described in the earlier report (1). It was later decided that less information would be secured if all the specimens of the third set were removed at the same time than if the more resistant steels were permitted to remain longer. It does not seem as important to know what the relative losses in weight of a series of steel were at a given date as to know how many years would pass before each steel suffered a given weight loss.

The results are presented in Fig. 3 where a dotted line is shown representing a weight loss of 10 g. per sq. dm. per specimen. Experience in atmosperic corrosion tests of steels run by this laboratory has shown that perforation of steel sheet 0.03-in. thick is apt to occur when the loss in weight of chemically cleaned specimens reaches approximately this level. This initial perforation can be detected only by removing the rust from the specimen. In Table VI, the various steels of the 1934

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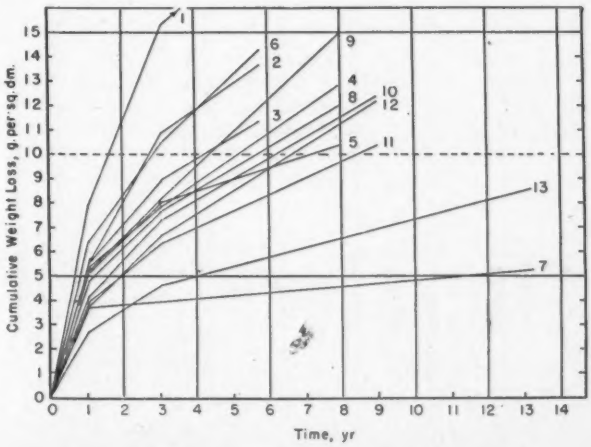


Figure 3. Atmospheric tests at Bayonne, started in 1934.

series are arranged in order of the time of exposure elapsed until a loss of 10 g. per sq. dm. occurred. This time was estimated from the corrosion curves and represents great uncertainty of extrapolation for the very resistant steels Nos. 7 and 13.

When the exposure specimens of steels Nos. 7 and 13 were cleaned at the end of the test (13.25 yr.), it was observed that the maximum penetration by pitting of the copper-silicon-chromium steel was about 18 mils, whereas that of the 5 per cent nickel steel was only 12.3 mils. The pitting factor[3] of steel No. 7 was 6.8 as compared with the more normal 2.8 for steel No. 13.

It can be concluded from this series of tests that good resistance to weathering in an industrial atmosphere is to be found in the more highly alloyed constructional steels and the copper-molybdenum and copper-silicon chrome steels.

Acknowledgment: Many of the inspections of these exposure series were made by H. R. Copson of this laboratory, whose assistance is gratefully acknowledged.

Wheat Straw Newsprint by The Kinsley Process

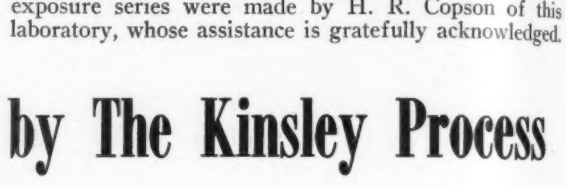
The trial run of wheat straw newsprint, which was made by the Kinsley Process at the plant of the Chemical Paper Mfg. Co., Holyoke, Mass., on September 7, has attracted a great deal of interest. There have been a great many inquires for information on the process, especially from the large wheat producing states in this country and from South America, Europe and South Africa.

The commercial trial at Holyoke was made after many months of research at the Kinsley Laboratory in Cleveland, O. This research was under the direction of E. R. Tomlowski, technical director of the Kinsley company.

In making the trial at the plant of the Chemical Paper Mfg. Co., it was realized that the equipment available was inadequate to completely demonstrate the process. Although the process uses various pieces of equipment now in general use throughout the industry, it would be difficult to obtain the use of an existing mill with just the right combination of equipment necessary to produce the best results with this process. In this first commercial trial the screening system was inadequate to remove the shives and equipment was not available for multi-stage bleaching. Both of these problems may be easily solved in a mill designed especially for the production of straw pulp and paper.

In spite of the inadequate equipment which caused the paper to be quite shivy and rather yellowish in appearance, the trial was considered to be very successful. The paper had excellent formation and was much stronger than regular newsprint. As a matter of fact, the paper is quite different than regular newsprint and with proper bleaching and screening would no doubt be suitable for papers of a much higher grade.

The pulping process is apparently quite simple as shown in the flow sheet. Bales of straw are dumped into the Rotary Cooker with no preparation other than removal of the baling wire. Cooking is done at low temperature and low pressure. The chemical cost is estimated at



Flow sheet for straw pulp manufacture, Kinsley process.

$14.00 per ton without recovery, but the use of a recovery system should materially reduce this figure. Bleaching is not included in the above cost, as the amount of chlorine required will vary widely depending on the degree of whiteness required as well as on the efficiency of screening.

The laboratory work indicated a probable yield of 50 percent and the yield on the first commercial trial, as estimated by C. J. Yarber, general superintendent of the Chemical Paper Mfg. Co., was approximately 46 percent.

Wheat straw fibers are shorter and smaller in diameter than coniferous wood tracheids but are somewhat longer than most hardwood fibers or vessel segments. As would be expected, the strength of the pulp lies somewhere between hardwood and coniferous wood chemical pulp.

According to H. L. Kinsley, president of the Kinsley Chemical Co., patents for the process are now pending and licenses for use of the process will be issued on the bases of one dollar per ton royalty.

Literature

Johnstone Engineering & Machine Co., Parkesburg, Pa. Bulletin, "Johnstone Slitter Wheel Grinder." Describes briefly Johnstone slitting and roll winding machines, also uniform tension unwinders for the paper and paperboard, textile and other industries.

Metallizing Engineering Co., Inc., 38-14 30th street, Long Island City 1, N. Y. Catalog, "The Best of Everything for Metallizing." Complete listing of metallizing equipment, accessories and supplies. Describes and illustrates metallizing guns, air and gas controls, spray booths and dust collectors, blast machines and nozzles, and air compressors. Also introduces a Wire Control and Straightener Unit, Gas Flow Meter Unit, and Air Control Unit.

International Nickel Co., Inc., 67 Wall street, New York 5, N. Y. Booklet, "Standard Specialties for Strength,

Corrosion Resistance, Long Life," a handbook and catalog of monel, nickel and inconel parts and accessories. Designed to help industrial engineers, designers and buyers cut the cost of important machine components and accessories for corrosive and high temperature service.

International Nickel Co., Inc., 67 Wall street, New York 5, N. Y. Booklet, "Salt as a Corrosion Problem." Contents about equally divided between discussion of corrosion problems solved by salt industry and equipment for handling brine solutions in chemical and process industries.

Koppers Co. Inc., Koppers Bldg., Pittsburgh 19, Pa. Booklet, "Koppers, the Company, Its Products and Activities." Briefly relates the story of the business that coke ovens built.

Lufkin Foundry & Machine Co., Lufkin, Texas. Catalog, "Lufkin Gears", G-1. Covers complete line of Horizontal Parallel Shaft Herringbone Gear Speed Reducers and Speed Increasers.

Mead Sales Co., Advertising Dept., 230 Park avenue, New York 17, N. Y. Manual, "Planning the Modern Municipal Report." A sequel to an earlier study, "How to Plan the Annual Report", the manual is written for every town, city, state and national government official. Illustrated with halftones of town and city reports from all sections of the country which emphasize that the place to start improving government is in cities and towns. Included is a collection of graphs and charts showing ideas on how financial and progress statements can be effectively pictured. Prepared with the cooperation of The American Institute of Graphic Arts and the advice and help of the best pioneer authorities in the field of modern governmental reporting. Available without charge.

Eberbach & Son Co., Ann Arbor, Mich. Booklet, "Eberbach Announcer of Scientific Equipment, No. 48-10-32." Features Hydrometry Through the Ages, New Lite-Mite Magnification With Glare-Free Light. Burrell Tube Furnaces, Kimbel Glassware, Burgess Vibro-Craver, Bird Impact Mill, Todd Silent Burner, and Quality Furnace with Temperature Indicator.

General Electric Co., Apparatus Dept., Schenectady, 5, N. Y. Bulletins, "Synchronous Motors for the Lumber, Pulp and Paper Industries, GEA 5063", "New Triclad High-Speed Synchronous Generators, 900 Series, GEA 5125", "Proved Protection, A New Triclad Motor Line, GEA 5113".

Industrial Chemical Sales, Div. of West Virginia Pulp & Paper Co., 230 Park avenue, New York 17, N. Y. Booklet, "Precipitated Calcium Carbonates, Their Manufacture, Properties and Applications". Presenting "Snow Top and Caltec, their manufacture, properties and varied applications. Adaptation to the needs of the paper industry is discussed under "Applications—For Coating Pigment and Paper Filler".

E. D. Jones & Sons Co., Pittsfield, Mass. Bulletin, "Jones Jordans—Maintenance Data and Parts List". Provides instructions, drawings and illustrations. Explains Leveling and Setting, Piping, Dismantling Jordan for Refilling, Lubrication, Removal of Bearings, Grinding Instructions, Worm Gear Plug Adjusting Mechanism. Permits attachment of Jones Jordan Assembly Drawing, also allows for noting of respective Jordan's individual components such as plug and shell fillings, bearings, couplings, etc.

American Management Ass'n., 330 West 42nd street, New York 18, N. Y. Booklet, "Advances in Office and Financial Management." A checklist of 67 studies which provides information on advances in office, financial and insurance management for finance executives, personnel directors, office managers, and those responsible for corporate insurance buying. Case histories, analyses and recommendations by nearly 200 experts on management are presented.

Acme Steel Co., 2840 Archer avenue, Chicago 8, Ill. Booklet, "Profit By Stitching." Illustrates the complete line of Acme and Acme-Morrison Silverstitchers for stitching solid fibre and corrugated shipping containers. Also includes specifications and application photographs.

Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., Wayne & Roberts avenues, Philadelphia 44, Pa. Catalog No. 15-13, Electronik Potentiometers. Covers also Strip Chart and Circular Chart Recorders, Precision Indicators, Strip Chart and Circular Chart Controllers, Indicating Controllers, Pyrometric Switches, Thermocouple and Radiamatic Assemblies and the "continuous balance" principle, as well as Electronik Potentiometers. Schematic diagrams, photographs and dimensional drawings illustrate the constructional features and operating principles of instruments presented. Also included are illustrative tables of various control forms, typical control systems, style selection tables and other data helpful in the selection of instrumentation.

Shartle Bros. Machine Co., Middletown, Ohio. Bulletins, No. 100-S, which describes the Miami Selectifier Screen for removing foreign material from paper stock; No. 4-SB, which covers Dilts-Cowles Classifiner for mixed paper systems; No. 95-S, which presents the Shartle-Dilts Junk Remover as a hydrapulper accessory. All bulletins cover typical installations, provide specifications and schematic diagrams, and illustrate allied equipment for paper mill use.

Brooke Engineering Co., 4517 Wayne avenue, Philadelphia 44, Pa. Bulletin 20-A, Electronic Smoke Indicators. Includes also description and illustrations of Type "A" and Type "B" Recorders and Overfire Jet Controls.

Bethlehem Foundry & Machine Co., Bethlehem, Pa. Folder, "Bethlehem Flow-Tube." Combines cutaway views and engineering drawings to describe in detail operating principle. Curves plotted on cross-sectional and logarithmic charts illustrate the results of calibration tests.

Byron Jackson Co., Pump Div., Terminal Annex Box 2017, Los Angeles 54, Calif. Booklet, "B-J Bilt-On Pumps." Describes all classes of medium and low-head service. Selection tables also are included.

Chain Belt Co., 1600 W. Bruce street, Milwaukee 4, Wis. Bulletin, No. 48-27, "Rex Lumber and Pulp Mill Chains." Description and illustrations of various types of Rex Mill Refuse, Log Haul, Transfer, Conveyor and Power Transmission Chains are given. Rex Cast Tooth and Cut Tooth Sprockets are shown with information concerning design and availability. Other Rex products used in lumber and pulp mills also are described.

Cochrane Corp., 17th street & Allegheny avenue, Philadelphia 32, Pa. (In Canada, address Canadian General Electric Co., Ltd., 212 King street, West, Toronto 1, Ont.) Bulletin, "Hydromatic Single Control Valve." Describes this valve as standard equipment on Cochrane Zeolite Softeners and Pressure Filters. Cutaways of installations and survey of requirements are included.

Downingtown Mfg. Co., Downingtown, Pa. Bulletins, "Downingtown Cylinder Models" and "Downingtown-Wiener 'Pressure' Refiner." Pressure Refiner booklet tells of development, operating principle, construction and installation of unit. Photo-micrographs show comparative effects on fibres after passing through the refiner and other equipment.

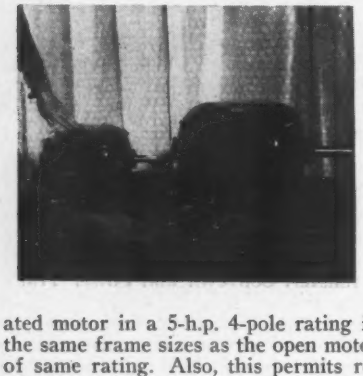
Duriron Co., Inc., Dayton 1, Ohio. Bulletin, No. 815, "Model 40 Corrosion Resisting, Series M. Durcopumps." Includes newest design features and complete exploded views of all parts. Detailed information on such accessories and modifications as packing, lubricant, vertical seals, water-jacketed stuffing boxes, strainers and claw impellers present a complete service in the handling of corrosive solutions, the manufacturer states.

Henry A. Gardner Laboratory, Inc., Apparatus Div., 4723 Elm street, Bethesda, Md. Bulletin, "Duplex Film Applicator." Introduces a new instrument for matching colors and for comparison of gloss and opacity.

Equipment & Supplies

Silicone Insulated Motor

The Silicone Insulated Motor is a high temperature Life Line A-C induction motor. Silicone resins for winding insulation and silicone grease for bearing lubrication are said to have made possible a totally-enclosed non-ventil-



ated motor in a 5-h.p. 4-pole rating in the same frame sizes as the open motor of same rating. Also, this permits reductions of as much as three frame sizes from present standard Class A insulated totally-enclosed motors. Manufacturer states that the efficiency, power factor and torque of such a motor are comparable to those for an open motor of same rating. Cut shows size reduction through use of silicones. Motor on left is a 5 h.p., 1750-rpm, 4-pole silicone insulated all steel Life-Line motor in 254-frame. Motor on right is rated the same but is Class A insulated and is in a 326-frame. Weight by using silicone is reduced from 250-pounds to 145 pounds, or is 60 percent of the Class A insulated motor. Height is reduced 3¼ inches, length 7¼ inches. It it stated that this reduction in size and weight is made possible by designing to take full advantage of the higher permissible temperature of silicone insulation. In motor applications where space is at a premium, such designs should open new fields, it is believed. For details and prices write to Technical Press Service, Westinghouse Electric Corp., 306 Fourth avenue, 1017, Pittsburgh 30, Pa.

Glyoxal

Glyoxal, a new chemical for industry, featured in the Trail Blazers Exhibit of the National Chemical Exposition in Chicago, October 12-16, was "originally identified by H. Debus in 1856. Glyoxal was early recognized as a chemical of great potential significance to industry," the Carbide & Chemical Corp., New York City, which markets the product, states. "Its two reactive aldehyde groups and its low volatility suggested it as a replacement for formaldehyde in many applications, and it was itself of great interest for carrying out the synthesis of certain pharmaceuticals and other complex organic molecules. In spite of its possibilities, however, 80 years passed before a commercially feasible synthesis was worked out. Then in 1936, two research chemists, Dr. R. W. MacNamee and Dr. J. T. Dunn, in the laboratories of Carbide & Carbon Chemicals Corp. at South Charleston, W. Va., found that small yields of Glyoxal could be obtained by the oxidation of ethylene glycol under carefully controlled conditions. Their process has made this reactive dialdehyde available to industry in tank-car quantities. One of the newest discoveries with regard to Glyoxal is its ability to impart wet strength to paper. Glyoxal in combination with equal parts of "Cellosize" hydroxyethyl cellulose gives equivalent wet strength to that obtained by treatment with melamine or urea-formaldehyde resins. The Glyoxal process is of particular advantage in the treatment of paper towelling and other absorbent types of paper since the increase in wet strength is achieved with no loss in absorbency. In fact, an actual increase in absorbency has been noted in many cases. Washable Wallpaper has been made water resistant by applying an over-coating of a soya-protein-casein mixture insolubilized by a mixture of alum together with 1 percent Glyoxal. The case-hardening effect of the Glyoxal prevents softening of the design when exposed to water either during washing or from the paste solution used in applying the wallpaper."

Self-Priming Pump

Lawrence Self Priming Pump is designed to operate as an efficient and positive air pump during priming operation, and subsequently as a regular centrifugal pump without any recirculation or loss of efficiency. Operation

during priming is illustrated. As indicated, a stream of liquid is circulated from Port A, through air separator, thence through Port 3 to pump casing, then to Port A. The stream entering Port A is heavily laden with air since that part of the casing contains the most air. This air is removed from liquid in the separator where its velocity is reduced. The clear liquid is then returned to the pump casing through Port B, and picks up another load of air during its passage from Port B to Port A. This process continues until all air has been exhausted from the suction line, suction chamber and pump casing. The pump then operates as a regular side-suction centrifugal pump since the casing is in the form of a volute with two discharge ports opposite each other and each proportioned for one half of the normal capacity of the pump. No valves of any kind are required. It is necessary only to fill the pump casing and suction chamber with liquid when pump is first started. Construction is simple and differs from standard design only in that the pump casing or volute is made with two discharge ports opposite each other. In addition, a trap or suction chamber is provided on the suction, and another chamber on the discharge to act as an air separator. Because it will handle both gases and liquids, also liquids containing solid matter in suspension, possible applications for the Lawrence self-priming pump are said to be innumerable. For details and prices write to Lawrence Machine & Pump Corp., 371 Market street, Lawrence, Mass.

P.C. Super-Tack

P.C. Super-Tack Adhesive is described as a water-soluble, flowable material for either machine or brush application. It is said to have tremendous additional tack and to effect positive permanent adhesion to such difficult surfaces as tin, lacquered and varnished surfaces, plastics, cellulose acetate, brass, copper, aluminum, chromium, nickel, etc. Developed as a label adhesive, manufacturer states that it effects immediate initial grab; its films are water resistant and highly flexible, not effected by temperature changes; that it will not foam in machine operations; eliminates label warping or buckling because of its high solids content, and will effect positive permanent and all-over adhesion to difficult surfaces; is water soluble and will not gum up machine rollers or glue troughs; will not deteriorate over long storage periods; is highly economical because of its tremendous spreading qualities. Available in one gallon cans, five, ten and 30 gallon drums. For details and prices write to Paper Chemicals, Inc., 510 West 27th street, New York 1, N. Y.

Gas-Filled Recorders

Gas Filled Recorders are announced as a new line of temperature recorders and recording pressure gages. Temperature tube systems feature an all stainless steel, Heli-arc welded construction with an improved design of spiral spring. Standard bulb design is arranged so it can be converted in the field into any of the usual apparatus connections; union flange or hub with bendable extension; union with separable socket with or without extension neck; adjustable connection with split

flange. Recorders are available with 1, 2, 3 or 4 pens, and are designed to provide for easy field installation of the actuating system and pen mechanism if, for example, a 1-pen recorder is to be made into a 2, 3, or 4 pen instrument. For Catalog 700 and prices write to Penn Industrial Instrument Corp., 3116 North 17th street, Philadelphia 32, Pa.

Leva-Dock

The Leva-Dock is a hydraulic device which makes it possible to load directly into or unload from trucks or trailers without using steel plates, bridge ramps, or other slow and sometimes dangerous methods. The Leva-Dock is a hinged platform supported by a hydraulic jack. With front end of the platform raised, the truck or trailer is backed into position for unloading or loading. Then the Leva-Dock platform is lowered until the heavy supporting arms rest on the truck or trailer floor. The gap between the Leva-Dock and the vehicle is bridged by a steel "throw-over" bridge. The hydraulic system is then released so that the front end of the platform is free to travel up or down with the truck bed as truck springs are relieved or compressed during loading and unloading. For details and prices, write to Rotary Lift Co., 1054 Kansas street, Memphis, Tenn.

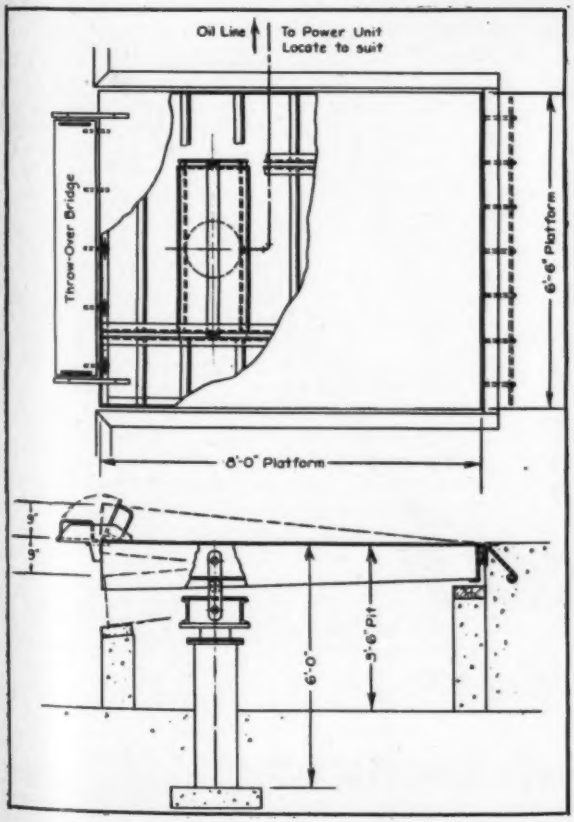
Plastic Partition Blocks

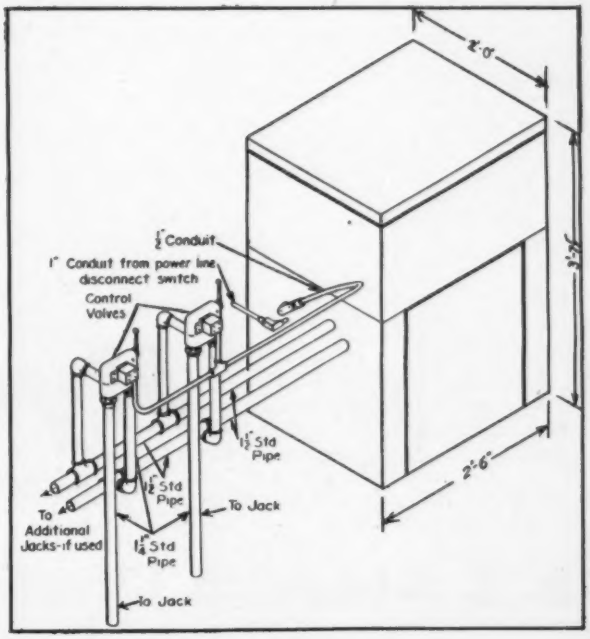
Plastic partition blocks resembling glass brick and weighing one-fifth the glass counterpart are recommended for interior installation in home, store or business office. Interlocking lips permit non-load-bearing walls or temporary wall partitions to be built without using adhesive or clamps, the manufacturer states. Blocks are 7¾ inches square and almost 4 inches thick, weigh slightly over a pound each. Facets are molded into the inside surfaces of block faces so that the finished block diffuses light. For a permanent wall, mastic cement or wood strip between blocks is recommended. Temporary installation can be made with a wood framework for bracing. Installation is recommended in such manner that the blocks carry only their own weight. For details and prices write to Monsanto Chemical Co., Plastic Div., 1700 South 2nd street, St. Louis 4, Mo.

↑ Above—Leva-Dock installation showing how difference in heights between dock level and truck bed is compensated.

← Left—Plan and side elevation of Leva-Dock.

↓ Below—Leva-Dock remote control installation.





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HYCAR latex added directly to the pulp in the beater or head box, or used as an impregnant for paper, imparts valuable properties not otherwise readily obtained.

Tear and wet strength are considerably increased. Resistance to oils, solvents and chemicals is obtained, with retention of good aging properties. The addition of Hycar also insures excellent flex life and scuff resistance, and in thick papers prevents separation of the laminations.

Thus, better physical properties may be obtained in high grade pulp. In other cases the use of lower grade stock may be permitted because of improved physical properties obtained by the use of Hycar latex. Paper is made adaptable to fields where it is not now used.

Present and potential applications for papers of this sort range from wallpaper to insoles, from gaskets to leather replacement material, from shelf liners to packaging papers.

HYCAR latex is very easy to use. In most applications no vulcanization is required. Normal drying times are used. And HYCAR latex is an inherently safe material to handle. *No solvent system is needed.*

We would be glad to work with you on any problems relating to the use of HYCAR latex. For more information, please write Department HJ-12, B. F. Goodrich Chemical Company, Rose Building Cleveland 15, Ohio.

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122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

A Study of Slime Control in a Groundwood Mill*

By B. F. Shema[1], J. B. Anderson[2], and J. W. Appling[3]

Abstract

The authors describe their fundamental studies on slime control which were in progress at The Institute of Paper Chemistry during the calendar year of 1947. Data on slime control are presented from two co-operating mills—a groundwood mill and a book paper mill. The studies in the groundwood mill were the more extensive and involved the effect of various methods of treatment. It was found that a slug method of treatment was the most efficient for reducing the amount of slime. The quantity of slime formed during each treatment was measured quantitatively with the aid of special slime-measuring units. A definite correlation exists between the amount of toxicant present, the period of time during which the toxicant is biologically active, and the formation of slime in the mill system.

It would be repetitious to review the literature on slime control since it has been adequately covered in the many papers published in the past few years. A complete historical review can be found in papers by Appling and others *(1-3)*.

During the past several years, it has become increasingly apparent that variations exist in the efficiency of a particular toxicant, especially when it is used as an agent for slime control. One of the factors that may cause this variation is the method of application. Therefore, one of the objectives of this study was to determine which method of treatment is the most effective—a slug method or a method of continuous dosage.

In many mills, it is very difficult to determine in advance the formation of excessive amounts of slime. It has been observed on several occasions that a sufficient amount of slime is produced overnight to make it necessary to shut down the mill completely for the cleanup operations. In these cases, there are no obvious macroscopic changes in the mill system which would indicate excessive formation of slime. Therefore, it is of great importance to be able to predict, with some degree of certainty, these periods of excessive slime formation. If this condition could be adequately forecast, even 24 hours in advance, the mill could then take proper remedial measures and the shutdown period could be eliminated or considerably shortened. Thus, another objective of this study was to determine whether or not it is possible to adequately forecast the formation of excessive amounts of slime.

Experimental Procedure

This study was chiefly concerned with a slime problem in a groundwood mill and emphasis was placed on the collection of data from this portion of the mill. However, since this is an integrated mill, data from the paper machine are included whenever possible. Bacteriological data were collected in the groundwood mill but, because of the many variables inherent in paper mill operation, were not obtained for that type of mill.

The mill in which these studies were made is somewhat more elaborate than most groundwood mills, although its flow sheet (Fig. 1) shows a fundamental similarity to other mills. The retention time of the pulp from the time of grinding to the time of use on the paper machine was estimated by mill personnel at approximately 12 hours. The temperature of the system throughout the study was approximately 45 to 50° C. The capacity of this mill is 50 to 60 tons per 24 hours and it generally operated 6 days per week. This schedule permits very thorough and regular washups, at which time the system is completely washed and the slime removed. The white water is also drained and replaced with highly chlorinated fresh water (1000 gallons of 35% bleach liquor per 55,000 gallons of water). It is the practice of this mill to shut down for approximately 4 to 6 hours in the middle of the week. This is a maintenance shutdown coupled with a very thorough washup. The Sunday washup is not as thorough, although the white water is drained and replaced with highly chlorinated fresh water.

Because of the nature of this experiment, only one toxicant (Lignasan X) was investigated. This toxicant was selected because it was the practice in this mill to use this material for slime control. In the past, this material, coupled with good housekeeping, has given adequate slime control. In order to obtain a basis for determining

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

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[2] Technical Associate, The Institute of Paper Chemistry, Appleton, Wis.
[3] Member TAPPI; formerly Research Associate, The Institute of Paper Chemistry, Appleton, Wis. At present, Director of Microbiological Research, Buckman Laboratories, Inc., Memphis, Tenn.

the dosage rate of Lignasan X for our experimental work, the probable minimum effective dosage rate was determined in the laboratory. The method used is fully described by Appling, McCoy, and Shema *(3)*. However, for this study, it was necessary to make the following changes: *(a)* the contact time was changed from 6 to 3 hours and *(b)* the probable minimum effective dosage which was selected was the one which reduced the bacterial count by at least 95%. Using this procedure, the calculation of the probable minimum dosage rate for Lignasan X was about 1.5 p.p.m. This dosage rate was determined prior to any treatment in the mill.

According to mill personnel, it was calculated that 1.5 p.p.m. of Lignasan X was approximately the usual rate of dosage and this was used in this study. During this study, irrespective of the treatment, the total amount of Lignasan X used never exceeded ½ pound per ton of wood ground.

This study was of the repetitive type in order to compensate for some of the variables that would be encountered during the experimental phases. The following experimental pattern was used:

A. No treatment.

B. ½ pound Lignasan X per ton of groundwood added once an hour.

C. ½ pound Lignasan X per ton of groundwood added once every shift (6 hours).

D. 2½ pounds Lignasan X added once a shift (6 hours) and 1 pound of Lignasan X added at the beater twice a shift on 2 shifts and once a shift on the other 2 shifts.

Treatment of the groundwood system from May 1, 1947 to December 6, 1947 was according to the following schedule.

Period	Treatment	Period	Treatment
May 1-14	A	August 18-August 30	C
May 15-28	B	Sept. 2-Sept. 13	B
May 29-June 14	C	Sept. 15-Sept. 27	A
June 16-June 28	D	Sept. 29-Oct. 11	D
June 30-July 12	A	Oct. 13-Oct. 25	B
July 14-July 26	C	Oct. 27-Nov. 8	D
July 28-August 9	C	Nov. 10-Nov. 22	C
August 11-August 16	A	Nov. 24-Dec. 6	A

The sequence of treatments as indicated is not as it was originally planned. Because of operational difficulties, it was necessary to continue C treatment for a longer period of time. These difficulties were not due to the use of Lignasan X or to an increase in slime formation because of the treatment, but rather to changes in the furnish on the paper machine. C treatment was run for the extended period of time since preliminary results indicated that it was the best method of treatment; the carry-over effect to the paper machine was more evident than with any of the other treatments.

Attempts were made to obtain a more quantitative method of determining the amount of slime formation. Since most mills do not have adequate bacteriological facilities, it was hoped that measurement of slime would be a more feasible method of determining the effectiveness of a given treatment.

The amount of slime formed was measured with two different slime-measuring units. The large unit (as shown in Fig. 2) was designed, and has been successfully used, by McCall and Hudson of the Union Bag & Paper Corporation *(5)*. This unit is 24 × 14 × 6 inches; the 1-inch holes are spaced equidistant on the front and sides of the assembly, and the back is not perforated. The test board inserted in the center of the unit is a piece of clear pine 12¾ inches in width. An area of 1 square foot is permanently marked on the surface of the board. The unit used by McCall and Hudson was made from stainless steel; however, the units used in

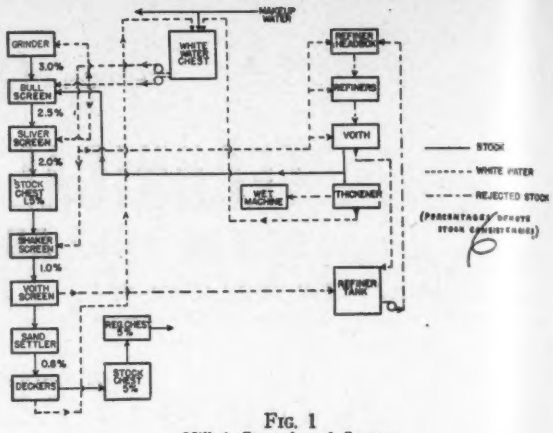

FIG. 1
Mill 1 Groundwood System

this experimental work were made from galvanized iron. At periodic intervals, the slime formed on this area is collected and weighed. The slime is scraped off with a rubber spatula since a steel spatula tends to roughen the surface of the sampling area and, over a period of time, would introduce an error in sampling.

In the groundwood mill study, the unit was placed in the sand settler. Because the volume of the stock (about 1% consistency) was not sufficient to completely cover the unit in an upright position, it was necessary to place the unit on its side with the front (perforated) in the upstream direction. When sampling, the unit was removed from the system and allowed to drain. The test board was then removed and the slime from the designated area was scraped into a tared container. The results were reported as grams of slime per square foot per unit of time. The sample was dried to constant weight at 50° C. and weighed again. For comparison, it is necessary to collect the samples at regular intervals. In general, good correlation was obtained with this unit between the amount of slime collected and the general condition of the groundwood mill. Differences were obtained for each of the different treatments.

The other slime board assembly (Fig. 3) was designed by Buckman Laboratories, Inc. At the present time, this laboratory has designed another unit. Therefore, the illustrated unit should be considered as a step in the evolution of developing a satisfactory slime-measuring unit for use in a pulp or paper mill system. This unit is considerably smaller than the previously described assembly, measuring $13\frac{1}{16} \times 5\frac{5}{16} \times 5\frac{5}{16}$ inches. Obviously, the advantage of such a unit is its size, because it can be located in more places in the mill system. The test board in this unit is also made from a clear piece of pine. The area of the slime panel is 250 sq. cm. on each side. The same precautions are observed when obtaining the slime from the two test panels. In our studies, this unit was placed in the sand settler in the mill system. In comparing the performance of the two boards, it was found that the larger unit gave the most consistent results and its use will enable the observer to predict excessive slime formation with a greater degree of certainty. It seems likely that this was not the result of the difference in fundamental design but rather of the size of the test area. It seems reasonable to expect that a unit somewhere between the two in size would serve the purpose better.

Throughout the study in the groundwood mill, the following data were collected: bacterial counts, deposition of slime on the slime board assemblies, the presence of biologically active Lignasan X in the system, and the number of breaks on the paper machine caused directly

by slime spots. Samples for bacterial counts were collected at two points in the mill system—the sand settler and the white water in the grinder. These two points were sampled daily with the exception of Sundays, holidays, and during the washup periods. The time of sampling was approximately 10:15 A.M. each day. Generally, within 30 minutes after collection, these samples were plated, using Difco dextrose agar, and incubating for 48 hours at 37° C. Slime was collected from the slime boards at periodic intervals. Because of the routine shutdown periods at the mill, it was necessary to have the following schedule of slime collection: 48 hours, 24 hours, and 48 hours. Thus, three slime samples were obtained per week for the large slime measuring unit (Fig. 2). In using the smaller unit, the slime from one side of the board was collected daily, whereas that from the other side was collected, as in the case of the larger unit, every 48, 24, and 48 hours. The determination of the

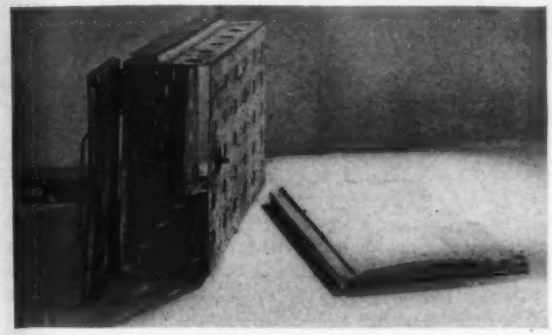

FIG. 2
Slime Board Assembly Designed by Union Bag & Paper Corporation

presence and duration of the biologically active principles of Lignasan X was made for each treatment. This method is described elsewhere *(4)*.

The studies at mill No. 2 were not as extensive as at mill No. 1, although significant data were obtained; these data were collected for the most part by mill personnel. The bacteriological data for the two 1-week periods were collected by the senior author.

The study in this mill was restricted to the paper machine because the furnish on this machine remained relatively constant. The criterion used to measure the results was the amount of slime which accumulated on the large-type unit (Fig. 2) in a 24-hour period. The small-type unit was also used in this mill but significant data were not obtained. In order to obtain comparative results, these units were placed in the same location in the mill system. Variations in the amount of slime formed on the large unit were not observed on the small unit. These variations were generally correlated with the general condition of the paper machine.

Experimental Results

MILL No. 1.

As stated previously, the experimental study was begun on May 1 with a 2-week period of no treatment. The bacterial counts obtained during this period were normal for this mill, the average counts being 1,850,917 colonies per ml. at the sand settler and 2,601,834 colonies per ml. for the white water at the grinder. The average wet weight of the slime collected from the slime units per square foot was 177.1 grams in 48 hours, and the average dry weight was 6.9 grams. This was a normal period of operation in this mill. The counts did not vary greatly, although more slime was collected from the unit during the second week of this period.

On May 15, after the cleanup, treatment B (½ pound of Lignasan X per ton of wood ground added once an hour) was initiated. The average bacterial count during this period of treatment was considerably lower than that during the period of no treatment. The average count was 440,563 colonies per ml. at the sand settler and 570,904 colonies per ml. for the white water at the grinder. However, the weight of slime collected was greater than during the period of no treatment. The average for this period was 266.8 grams (wet) and 10.15 when dried (48 hours). The weekly average amount of Lignasan X added was 186.25 pounds.

On May 29, treatment C [½ pound of Lignasan X per ton of groundwood added every shift (6 hours)] was begun after the cleanup. The average bacterial count for this treatment period was 718,800 per ml. for the sand settler and 608,234 per ml. for the white water at the grinder. The counts for the second week of the treatment were higher than those for the first week. Also, slightly more slime was observed for the same comparable period during the second week. During the first week, no slime was detected and in the second week only a slight slippery feel on the test panel was noted. This may have been caused by the fact that, during the second week of treatment, only 87.5 pounds of Lignasan X were used as compared with 137.25 pounds for the first week. Thus, a weekly average of 112.5 pounds of Lignasan X was used.

D treatment (2½ pounds Lignasan X added once each shift (6 hours) and 1 pound of Lignasan X added at the beater twice each shift on two shifts and once each shift on the other two shifts) began on June 16 and continued for 2 weeks. The average bacterial counts were 1,070,900 colonies per ml. for the sand settler and 1,052,900 colonies per ml. for the white water at the grinder. Because of operational conditions, it was not possible to obtain comparable data from the slime board during this period; however, it was estimated that less slime accumulated than during the B treatment and considerably more than that which accumulated during the previous C treatment. An average of 41.25 pounds of Lignasan X per week was used during this period.

The D treatment was followed by a period of no treatment. During the first week, the counts at the two sampling points were quite high but dropped for unexplainable reasons the following week. However, the average counts were high—1,964,000 colonies per ml. for the sand settler and 1,846,200 colonies per ml. for the white water at the grinder. Again, because of operational conditions, it was impossible to obtain comparable data from

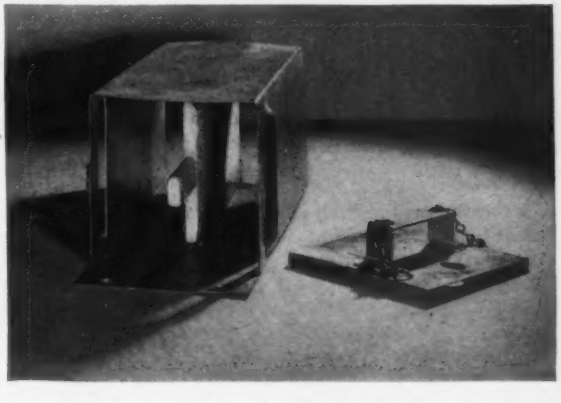

FIG. 3
Slime Measuring Unit Designed by Buckman Laboratories, Inc.

TABLE I.—WEEKLY AVERAGE OF DATA COLLECTED FOR EACH TREATMENT DURING THE ENTIRE STUDY

Treatment	Period of Treatment	Average Bacterial Counts, No. per ml.		Average Weight of Slime, g./48 hr.		Average Amount of Lignasan X Added, lb.
		Sand Settler	White Water at Grinder	Wet Weight	Dry Weight	
A	May 1-May 7	1,825,833	2,831,667	124.0	4.3	0.00
A	May 8-May 14	1,876,000	2,372,000	230.2	9.5	0.00
B	May 15-May 21	237,925	596,167	313.6	9.6	166.50
B	May 22-May 28	643,200	545,640	220.0	10.7	206.00
C	May 29-June 7	600,400	559,800	0.0	0.0	137.25
C	June 9-June 14	827,200	656,667	+	+	87.75
D	June 16-June 21	1,203,600	1,398,800	....	...	60.00
D	June 23-June 28	938,200	717,000	....	...	22.50
A	June 30-July 5	1,229,000	1,430,000	....	...	0.00
A	July 7-July 12	197,667	812,250	....	...	0.00
C	July 14-July 19	186,920	116,900	0	0	198.50
C	July 21-July 26	485,200	346,833	+	+	192.75
C	July 28-Aug. 2	674,320	889,160	+	+	110.00
C	Aug. 4-Aug. 9	194,800	89,650	+	+	131.50
A	Aug. 11-Aug. 16	1,964,000	1,846,300	....	...	0.00
C	Aug. 18-Aug. 23	701,400	743,600	16.9	0.9	147.75
C	Aug. 25-Aug. 30	1,244,000	1,441,800	21.3	1.5	136.00
B	Sept. 2-Sept. 6	257,250	154,250	....	...	132.00
B	Sept. 8-Sept. 13	474,000	950,000	78.7	3.4	160.75
A	Sept. 15-Sept. 20	1,298,640	1,218,000	147.1	6.8	0.00
A	Sept. 22-Sept. 27	1,390,000	1,065,000	278.4	13.2	0.00
D	Sept. 29-Oct. 4	1,480,000	1,379,600	90.9	3.2	52.50
D	Oct. 6-Oct. 11	1,103,200	879,800	204.1	8.2	60.00
B	Oct. 13-Oct. 18	465,740	540,700	290.9	14.3	142.75
B	Oct. 20-Oct. 25	923,880	709,860	179.1	6.7	173.50
D	Oct. 27-Nov. 1	1,385,000	1,915,900	94.2	4.1	50.00
D	Nov. 3-Nov. 8	1,350,000	1,275,000	....	...	47.50
C	Nov. 10-Nov. 15	799,660	478,800	114.2	4.5	85.50
C	Nov. 17-Nov. 22	1,423,750	823,750	142.1	6.0	116.75
A	Nov. 24-Nov. 29	2,292,000	1,820,000	256.0	10.1	0.00
A	Dec. 1-Dec. 6	4,265,000	3,465,000	308.8	11.2	0.00

the slime board assembly during this period. Considerable amounts of slime were observed, however, even during the second week when the counts were relatively low.

On July 14, the second C treatment began. This treatment was for a duration of about 4 weeks and will be discussed as two individual 2-week treatments. About this time, the paper mill was troubled with a serious slime problem and, because of previous data, the mill personnel wished to continue this particular treatment until the condition on the paper machines improved. The slime problem on the machine was not the result of any treatment but was attributed to a change in operational procedure. The average bacterial count for the first 2-week period was 336,060 colonies per ml. for the sand settler and 231,867 colonies per ml. for the white water at the grinder. There was only a perceptible amount of slime found on the board—not enough, in fact, to obtain an adequate sample. During this period, an average of 175.62 pounds of Lignasan X was used per week. In the second 2-week period of this treatment, the average counts were somewhat higher, being 412,060 colonies per ml. for the sand settler and 489,405 colonies per ml. for the white water at the grinder. During this period, a smaller amount of Lignasan X was added to the system—an average of 120.75 pounds per week as compared with the average of 175.62 pounds added the previous weeks. The slime formed during this 2-week period was also small in magnitude, so that it was impossible to obtain an adequate sample.

A period of no treatment (A) was introduced at this point which lasted for 1 week. During this time, the bacterial counts were as high as during normal operation. The average count for the sand settler was 1,964,000 colonies per ml. and 1,846,200 per ml. for the white water at the grinder. The A treatment was then followed by another C treatment. During the first week of this treatment, the counts were considerably reduced but, in the second week, the counts increased—the average of the two-week period being 972,700 colonies per ml. for the sand settler and 1,092,700 colonies per ml. for the white water at the grinder. The slime collected on the slime board averaged 19.1 grams (wet weight) per week. The average amount of Lignasan X added per week was 141.87 pounds, with somewhat more Lignasan X added during the first week than during the second.

The next period was a B treatment, at which time the bacterial counts dropped to an average of 377,667 per ml. for the sand settler and 502,125 per ml. for the white water at the grinder. It was possible to collect slime from the assembly only during the second week of the treatment. The wet weight was 78.7 grams (3.4 grams when dried). The quantity of Lignasan X used the first week was 146.37 pounds. Considerably more was used the second week, at which time the bacterial counts were the highest. This treatment was then followed by a period of no treatment (A). The average bacterial counts again increased to 1,344,320 per ml. at the sand settler and 1,141,500 per ml. of the white water at the grinder. The average wet weight of slime collected per square foot was 212.75 grams (10.0 grams when dried to constant weight). This is a considerable increase over the amount of slime collected during the B treatment.

The D treatment, which started on September 29, did not show any appreciable drop in bacterial counts during the first week over the previous period of no treatment. However, there was a marked reduction in the amount of slime collected from the test panel. During the second week of this treatment, the bacterial counts were somewhat lower but the amount of slime collected was considerably greater.

The average bacterial counts during this period were 1,291,600 per ml. for the sand settler and 1,129,700 per ml. for the white water at the grinder. The average wet weight of slime was 147.5 grams per square foot (5.7 grams when dried). An average of 56.25 pounds of Lignasan X per week was used during this period.

The B treatment that followed appreciably reduced the bacterial count to an average of 694,810 per ml. at the sand settler and 625,280 per ml. at the white water at the grinder. The amount of slime collected was considerably greater than during the previous D treatment, having an average wet weight of 235.0 grams. The average amount of Lignasan X used was 185.128 pounds per week.

Another D treatment followed the B treatment. During this period, the bacterial counts approximately doubled. The average count at the sand settler was 1,-

367,875 per ml. and 1,595,450 per ml. for the white water at the grinder. However, there was a marked reduction in the amount of slime formed on the test panel. The average wet weight was 94.2 grams. An average of 48.75 pounds of Lignasan X was used per week.

During the next period (C treatment), the bacterial counts were somewhat lower than during the previous D treatment, with a great reduction in the bacterial count of the white water. Also, the amount of slime collected was considerably less. The average bacterial counts during this period were 1,111,675 per ml. at the sand settler and 601,270 per ml. for the white water at the grinder. The average wet weight of slime collected was 128.15 grams (5.25 grams when dried). A weekly average of 101.12 pounds of Lignasan X was used during this period.

In order to obtain a check on the system after the completion of the various treatments, another control was run. During this period, the average bacterial counts were 3,278,000 per ml. for the sand settler and 2,642,500 per ml. for the white water at the grinder. The average wet weight of the slime was 282.4 grams (10.65 grams when dried to constant weight).

The average data per week for each treatment are presented in Table I, the average of the data collected for each treatment period in Table II, and the average data for each treatment in Table III.

It is apparent from the data presented in Table III that the lowest bacterial counts were obtained during the B treatment; however, the counts during the C treatment were also low. This would seem to indicate that the B treatment was the most effective. However, when the weight of slime collected on the slime-measuring unit is compared, the C treatment showed the lowest index of slime formation. When the data from these two criteria are compared, the indications are that no correlation exists between the number of bacteria in a mill system and the possibility of slime formation. However, it must be remembered that, when the samples were collected for bacteriological analysis, those obtained during the B treatment were collected 30 to 45 minutes after the addition of the required amount of Lignasan X and the samples for bacteriological analysis from the C treatment were collected 4½ to 5 hours after the addition of the Lignasan X. Because of this time interval, it is reasonable to expect that these counts should be somewhat higher than those obtained from the B treatment. It is important therefore that, when bacterial counts are to be used as an index of slime formation, the samples for bacterial analysis should be taken at the same time interval after the addition of the toxicant.

TABLE II.—AVERAGE OF DATA COLLECTED FOR EACH TREATMENT PERIOD

Treatment	Period	Bacterial Count Bacteria/ml. Sand Settler	Bacterial Count Bacteria/ml. White Water at Grinder	Weight of Slime, g. Wet	Weight of Slime, g. Dry	Amount of Lignasan X Used, lb.
A	May 1-May 14...	1,850,917	2,601,834	177.1	6.9	0.00
B	May 15-May 28..	440,563	570,904	266.8	10.5	186.25
C	May 29-June 14..	718,800	608,234	+	+	112.50
D	June 16-June 28..	1,070,900	1,052,900	....	...	41.25
A	June 30-July 12..	713,333	1,121,375	....	...	0.00
C	July 14-July 26..	336,060	231,867	+	+	175.63
C	July 28-Aug. 9...	412,060	489,405	+	+	120.75
A	Aug 11-Aug. 16..	1,964,000	1,846,000	....	...	0.00
C	Aug. 18-Aug. 30..	972,700	1,092,700	19.1	1.2	141.88
B	Sept. 2-Sept. 13..	377,667	502,125	78.7	3.4	146.38
A	Sept. 15-Sept. 27.	1,344,320	1,141,500	212.75	10.0	0.00
D	Sept. 29-Oct. 11..	1,291,600	1,129,700	147.5	5.7	56.25
B	Oct. 13-Oct. 25..	694,810	625,280	235.0	11.5	158.13
D	Oct. 27-Nov. 8...	1,367,875	1,595,450	94.2	4.1	48.75
C	Nov. 10-Nov. 22..	1,111,675	601,270	128.15	5.25	101.13
A	Nov. 24-Dec. 6..	3,278,000	2,642,500	282.4	10.65	0.00

The data collected from the slime board show that the C treatment is the most effective. Considerably less slime was formed during this period of treatment. There are great differences between the B and C treatments; as expected, the counts are somewhat lower for the B treatment, because of the sampling time and, also, because more Lignasan X was used per week. During this experimental period, the slime which formed on the slime-measuring unit during the D treatment was less than that which was formed during the B treatment but considerably more than that which formed during the C treatment. However, during the period of the D treatment, the average amount of Lignasan X used was considerably less than that used during either the B or C treatment.

From the data presented, it is apparent that the smallest dosage rate of Lignasan X had an appreciable effect upon the general condition of the mill system. Because of this rate of dosage and its effect upon the system, it is desirable to determine the amount and the duration of the biologically active principle of Lignasan X present in the mill system during the period of treatment. A method of determining the active principle present in the mill system has been developed and used during the experimental phases of this study. This method and the results of its study will be presented elsewhere. In general, the presence or absence of biologically active Lignasan X was determined for practically all the samples that were collected for bacteriological analysis. Depending upon the day of the week—that is, in respect to a washup—the duration and amount of biologically active Lignasan X varied. Immediately after the washup, irrespective of the rate of dosage, the amount of biologically active Lignasan X was high and persisted for a period of 30 to 60 minutes. This time was considerably reduced as the white water increased in solids content, since just before a cleanup this residual (same rate of dosage) would persist for only 5 to 10 minutes. In general and as expected, biologically active Lignasan X was first obtained at the sand settler and would show up later in the white water which was collected at the grinder. The amount of biologically active Lignasan X remained in the system for the longest periods of time when the Lignasan X was added on a shift basis.

Discussion

The study, as reported, was conducted in a groundwood mill which is integrated with a paper mill. The study was planned with the aid of mill personnel and it was their desire to have a repetitive type of experiment to obtain the information desired. Lignasan X in 4-ounce packets was purchased by the mill, and the various doses were placed in the pocket of the grinder, thereby insuring discharge of the Lignasan X into the system at about the same time.

This study has shown that a difference in slime control exists and that some of this difference may be attributed to the manner in which a particular toxicant is added to the system. It was apparent that the slug method of applying Lignasan X was the best procedure for this mill. This was correlated with the general cleanliness of the mill system. During this treatment, the presence of biologically active Lignasan at the sand

TABLE III.—AVERAGE OF DATA COLLECTED AT MILL NO. 1 FOR EACH TREATMENT

Treatment	No. Bacteria/ml. Sand Settler	No. Bacteria/ml. White Water at Grinders	Weight of Slime, g. Wet	Weight of Slime, g. Dry	Amount of Lignasan X Used, lb.
A	1,830,174	1,866,683	244.08	9.18	0.00
B	506,520	566,063	160.16	8.26	163.58
C	710,259	604,695	73.63*	3.3	130.38
D	1,243,458	1,259,350	120.85	4.9	48.75

* This figure should be lower because, on several occasoins, only a very small amount of slime was formed on the test panel (slippery to the touch). This amount was so small that it was impossible to obtain a significant weight.

TABLE IV.—BACTERIAL COUNTS FOR THE VARIOUS SAMPLING POINTS AT MILL NO. 2

(Treated with 4 ounce Merfenel at the reclaimed stock funnel and 126 pounds Santobrite in the groundwood system)

Date	Number of Bacteria per ml.							Breaks	
	Beater *	Stuff Box *	Broke Stuff Box	Headbox	Beater White Water Tank	Suction Seal Tank	Tray Water	Wet	Dry
June 23	1,000	280,000	630,000	10,000	100,000	70,000	80,000	7	28
24	10,000	920,000	1,280,000	580,000	780,000	400,000	530,000	7	32
25	152,000	23,000,000	35,200,000	9,000,000	25,300,000	7,600,000	13,300,000	11	17
26	1,010,000	5,900,000	40,000,000	7,400,000	12,400,000	7,500,000	7,000,000	4	14
27	730,000	6,200,000	23,500,000	7,900,000	15,100,000	5,350,000	6,700,000	7	14
28	1,570,000	29,600,000	33,000,000	8,500,000	12,500,000	7,800,000	7,800,000	9	11

* Colonies per gram.

settler and in the white water at the grinder persisted in greater amounts and for a longer period of time.

The slime-measuring units were an important aid in measuring quantitatively the amount and texture of slime formed. In these studies, the small unit did not give as good results as the large unit. It is understood that, at the present time, this small unit is being redesigned by Buckman Laboratories, Inc. Both of these units have some disadvantages. The large one is rather cumbersome and it seems likely that the small unit is too small to obtain the best results. Possibly a unit about midway in size would be most practical.

From the data presented, it appears that the bacterial counts are not a good criterion of slime formation. In general, B treatment produced lower counts than either C or D but it must be remembered that the samples for bacterial counts for the B treatment were taken 30 to 45 minutes after the required amount of packets of Lignasan were placed in the grinder pocket, whereas it was usually 4½ to 5 hours after the addition of the packets for either the C or D treatment. Thus, the samples for the latter treatments were collected at the time when the bacteria were probably present in greatest number.

Mill No. 2

Primarily because the preliminary data collected at mill No. 1 showed that it was feasible to use the large slime-measuring unit as a gage in determining the effectiveness of a given toxicant, it was feasible to initiate studies at mill No. 2. In this mill, it was possible to study, at the machine, the effect of any given slime-control agent because this particular machine operated on a schedule of 6 days per week and ran continuously on the same furnish. Therefore, the variables that are present on most other paper machines were eliminated or reduced to a minimum.

Because of distance, it was impossible to obtain daily samples for bacterial counts during the entire study, although such data were collected for two 1-week periods. These data are presented in Tables IV and V. The data contained in Table IV show the bacterial counts for several sampling points for the particular machine system. The treatment during this period was 4 ounces of Merfenel added every 2 hours at the reclaimed stock funnel and 126 pounds of Santobrite per day added to the groundwood system.

It should be pointed out that the entire production of the groundwood mill did not make up the furnish for this machine. The groundwood mill produces about 60 tons per day, approximately 35 tons of which are used on this machine; therefore, on a cost basis, the cost of the treatment in the groundwood system should be prorated, but it is very difficult to separate this treatment in terms of biological activity and the over-all effect for each machine system. Therefore, in subsequent tables the treatment will be given as it was applied to the entire groundwood system rather than reporting only that portion which was used on this machine. The bags of Santobrite that were added to the groundwood system were hung in the white water spout at the deckers. The white water is returned to the grinders and to the various other points in the system as it is needed for dilution. The BSM 11 was also added at this point.

As shown in Table IV, the bacterial counts for all points sampled were relatively low during the first day of operation and tended to increase daily during the remainder of the week. Most counts during this period were relatively high. Because of these high counts, it was desirable to study the effect of another treatment on the machine. It was impossible to begin this study the following week; however, a study using bleach liquor was initiated after an interval of two weeks. During this period the following treatment was in effect: 2 ounces of Merfenel were added every two hours at the reclaimed stock funnel and 126 pounds of Santobrite per day to the groundwood system. On July 14, a treatment using bleach liquor at the machine was initiated. Fifty gallons of bleach liquor were added to the beater white water tank once every 8 hour shift and 25 gallons of bleach liquor were added to the suction seal tank once every 8 hour shift plus 126 pounds of Santobrite added per day to the groundwood system. It is apparent from Table V that the bacterial counts are considerably lower during this period of treatment. During this and the previous period of treatment, the bacterial counts reached their peak on the 4th day of treatment and decreased the following 2 days. The bleach liquor was added at 9:00 A.M., 3:00 P.M., and 10:15 P.M. The samples for bacterial analysis were collected at approximately the same time daily—namely, 1:15 P.M. On several occasions, samples were collected at the beater white water tank and the suction seal tank one, two, and three hours after the addition of the bleach liquor. The counts during these time intervals did not vary appreciably but were

TABLE V.—BACTERIAL COUNTS FOR THE VARIOUS SAMPLING POINTS AT MILL NO. 2

(Treated with 50 gallons bleach liquor added to the beater white water tank and 25 gallons bleach liquor added to the suction seal tank once per 8-hour shift, plus 126 pounds of Santobrite added to the groundwood system.)

Date	Number of Bacteria per ml.							Breaks	
	Beater *	Stuff Box *	Broke Stuff Box	Headbox	Beater White Water Tank	Suction Seal Tank	Tray Water	Wet	Dry
July 14	1,600	.....	39,000	700	3,000	0	2,000	0	15
15	800	.....	20,000	5,000	7,000	3,000	3,000	6	9
16	1,300	.....	27,000	2,000	4,000	4,000	100	8	12
17	7,900	.....	255,000	12,000	17,000	15,000	10,000	7	12
18	2,400	.....	118,000	2,600	4,000	2,000	4,000	9	27
19	3,600	.....	149,000	2,900	124,000	9,000	24,000	11	15

* Colonies per gram.

TABLE VI.—AVERAGE WET WEIGHT OF SLIME AND AVERAGE NUMBER OF WET AND DRY BREAKS FOR EACH TREATMENT FOR MILL NO. 2

	Period	Days of Treatment	Average Wet Weight of Slime per Day, g.	Average Number of Breaks per Day	
				Wet	Dry
4 oz. Merfenel every 2 hours at reclaimed stock funnel 126 lb. Santobrite per day in the groundwood system	June 23 to June 28	6	...	7.50	19.66
2 oz. Merfenel every 2 hours at reclaimed stock funnel 126 lb. Santobrite per day in the groundwood system	July 7 to July 12	6	...	4.83	12.83
50 gal. bleach liquor to beater white water tank per 8 hr. shift 25 gal. bleach liquor to suction seal tank per 8 hr. shift 126 lb. Santobrite per day in the groundwood system	July 14 to July 19	6	6.86	6.83	15.00
No treatment on machine 126 lb. Santobrite per day in the groundwood system	July 21 to Aug. 16	24	6.59	6.83	8.45
No treatment on machine 84 lb. Santobrite per day in the groundwood system	Aug. 18 to Aug. 27	9	6.87	3.21	5.66
No treatment on machine 18 lb. BSM 11 per day (2 qt. 3 times a day) in groundwood system	Aug. 28 to Sept. 13	14	9.98	5.71	11.64
No treatment on machine 84 lb. Santobrite per day in the groundwood system	Sept. 15 to Sept. 27	12	6.44	5.25	13.50
2½ lb. BSM 11 every 2 hours to reclaimed stock funnel 84 lb. Santobrite per day in the groundwood system	Sept. 29 to Oct. 20	19	9.02	6.55	13.22
2½ lb. BSM 11 every 2 hours to reclaimed stock funnel 18 lb. BSM 11 per day (2 qt. 3 times a day) in groundwood system	Oct. 21 to Nov. 1	11	9.27	7.36	13.72
2½ lb. BSM 11 every 2 hours to reclaimed stock funnel 84 lb. Santobrite per day in the groundwood system	Nov. 3 to Nov. 29	23	10.40	5.43	10.43
1½ lb. Chemicide every 2 hours to reclaimed stock funnel 84 lb. Santobrite per day in the groundwood system	Dec. 1 to Dec. 6	6	19.96	7.16	10.16
4 oz. Merfenel every 4 hours to stock and broke beaters 84 lb. Santobrite per day in the groundwood system	Dec. 10 to Dec. 20	10	14.77	8.55	9.55
6 lb. Chemicide in stock beaters every 8 hours	Dec. 22 to Dec. 31	8	10.70	6.5	10.37

generally lower when the samples were collected during the first hour after the addition of the bleach liquor. On several occasions, when the samples were obtained at these points immediately after the addition of the bleach liquor, the samples were sterile. Because of the difficulty in adding the bleach liquor and because of the labor shortage, it was impractical to continue this type of study for an extensive period of time. However, these preliminary results are very promising.

Because of the very promising results obtained with the large slime-measuring unit, it was feasible to use this as a criterion in the evaluation of other toxicants and various other treatments in this mill system. During the remainder of this study, the mill personnel collected the daily accumulation of slime on the test panel of the slime board assembly.

For this study, it was difficult to run a controlled type of experiment because of the various shortages that existed and the difficulty encountered in obtaining the desired amount of toxicant.

The time and duration of each treatment period, the average number of wet and dry breaks, and the average daily weight of slime collected are presented in Table VI. From these data, it is evident that treatment on the machine increased the amount of slime collected from the test panel and, also, that there was an increase in the number of wet breaks. Santobrite appeared to be the best treatment in the groundwood system especially when used alone. The best slime control on the machine was achieved during the period of treatment. However, when 18 pounds of BSM 11 per day were added to the groundwood system, greater amounts of slime were collected on the slime board, and the number of wet breaks was somewhat higher than when 84 pounds of Santobrite were added to the groundwood system. The addition of Santobrite to the groundwood system and the addition of BSM 11 at the machine gave better control than when BSM 11 was used both on the machine and in the groundwood system. The use of 1½ pounds of Chemicide at the machine with the Santobrite in the groundwood system was the least effective of the treatments used, according to the amount of slime formed on the test panel and, also the general condition of the mill system. Some improvement was observed when 6 pounds of Chemicide were added to the stock beaters every 8 hours and 3 pounds of Chemicide were added to the broke beaters every 4 hours, plus the addition of 84 pounds of Santobrite in the groundwood system.

The data presented for mill No. 2 are reported as they were collected at the mill and should not necessarily be construed to mean that any one of the treatments described would give the same results in other mills. The treatments used in this study were chosen on the basis of merit by mill personnel and were not equal on a cost basis, since other factors which are important had to be considered in determining a satisfactory dosage rate for any given toxicant.

Conclusions

1. The slug method of treatment was the most effective method of slime control in mill No. 1, even when relatively small amounts of Lignasan X were used.

2. The special slime-measuring units were an important aid in measuring quantitatively the amount and texture of slime formed for each treatment.

3. In mill No. 2, there was a sufficient carry-over of Santobrite from the groundwood mill to the paper machine so that effective slime control was achieved. The addition of some toxicant to the paper machine seemed to stimulate slime formation.

Acknowledgment

The studies reported in this article have been sponsored by the Biological Control Committee of the American Paper and Pulp Association as a part of the fundamental microbiological research program conducted for the paper industry at The Institute of Paper Chemistry. Two integrated pulp and paper mills co-operated in this study. The particular toxicants for this study were purchased by the co-operating mills. The authors gratefully acknowledge the co-operation of the various individuals and the organizations that participated in this study. The authors also acknowledge the aid and counsel so generously provided by Dr. Willis M. Van Horn during the course of this investigation. The authors further wish to acknowledge the aid of Mr. J. F. McCoy, who collected the samples in the early phases of this study.

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Ohio TAPPI Discusses Sulphite Pulping

At Middletown, Ohio, October 12, 1948

The Ohio Section of TAPPI held its first meeting of the 1948-49 season at the Manchester Hotel, Middletown, Ohio on October 12, 1948. Ninety-two members attended.

The meeting was called to order by Chairman P. S. Cade, Harding-Jones Paper Company.

A motion made by K. P. Geogehen and seconded by Carl Roess was adopted unanimously to instruct the secretary to convey the sympathy of the Ohio Section to Mrs. Frank Roe, widow of the late R. B. Roe, technical director of the Sorg Paper Company and a charter member of the Ohio Section of TAPPI.

Vance P. Edwardes, Sulphite Superintendent of International Paper Company, gave a very interesting and comprehensive talk on Pulp and Pulping methods. He covered both mechanical pulp and the acid, neutral, and alkaline pulping methods. He discussed the woods used in the making of pulp and explained the advantages and disadvantages of the different woods for the various type cooks. He also emphasized the importance of wood preparation on pulp quality and stated that dirt must be removed in the wood room to obtain clean pulp.

The speaker then discussed the Soda, Sulphate, and Sulphite methods of cooking wood and brought out many of the new trends in cooking as well as newer developments in equipment such as the use of Chromium, Nickel Clad steel for digesters. He also covered the semi-chemical pulps and stated that this method is growing rapidly, particularly in the South, using gum wood; the advantages of this method of pulping is high yield and low cost and is used in corrugating and nine point.

Mr. Edwardes also discussed the Sodium Sulphite method, which produces hardwood pulps approaching the strength of Coniferous Sulphate but which has not yet been used commercially because of recovery difficulties.

The subject of bleaching was also very well covered with peroxide, Hydrosulphite, Chlorination, and Hypochlorite bleaching being discussed. The advantages of Sodium over Calcium bleaches were covered as well as the advantage of a Sulphur Dioxide wash to prevent color reversion.

A very lively question and answer period followed Mr. Edwards talk.

Those present included: C. E. Ahlm, Harold H. Brandt, W. H. Boast, H. Buechler, H. J. Buechler, A. S. Boyers, Bill Biven, L. Barnes, R. L. Betts, M. Burleson, P. S. Cade, R. R. Crawford, James Combie, T. M. Chemerys, Pat Daley, Bob Dalton, S. B. Early, Vance Edwardes, L. Eberhardt, J. S. Fridolph, H. Fitzpatrick, Harry C. Fisher, A. C. Groom, A. W. Griffith, D. J. Goodman, K. P. Geohegan, S. Richard Holmes, R. W. Holden, W. A. Honey, E. C. Hendrickson, C. H. Horch, Travis Q. Holden, B. F. Hale, Heckel, C. R. Haynes, K. Lewis Hackley, Robert C. Haynie, Carl Hoelderle, Thomas E. Jones, Jr., R. L. Jenk, John E. Jack, Harold R. Joiner, H. Knobel, S. E. Knowles, Harold C. Koch, Jack M. Kela, L. R. Kendall, E. O. Knapp, Edward Lum, Kent Lanick, Donald Loudin, Homer H. Latimer, Gene Lowey, F. E. Moser, Ken Maves, W. C. Mathews, Kon Matchuk, R. D. McCarron, B. L. Messias, C. R. Merriman, Warren Macklem, Charles Moore, W. W. McIntire, R. M. Miller, Paul C. Miller, Jerrold H. Moyer, D. W. Newell, John W. Natwick, J. A. Owens, C. A. Osborne, G. W. Pixler, Edward W. Petuch, Paul Petzold, E. A. Rinell, Doug Robbins, Frank A. Root, Carl D. Roess, C. A. Sorg, U. F. Stevenson, Philip E. Shick, G. H. Suhs, Don Stark, Arthur Thurn, W. W. Trunnell, Edgar Turnbull, C. R. Vande Call III, Chas. H. Waldhauer, David R. Weiser, Victor J. Wirpsa, D. M. Yost.

Half Hours With Great Scientists

The Reinhold Publishing Company has just published an interesting book entitled "Half Hours With Great Scientists" by Charles G. Fraser (526 pp. 6 x 9¼). This is essentially the story of physics. It is a book for the layman written on a plane that will be attractive to the technically trained men. Its chapters cover the stories of mechanics, acoustics, optics, thermics, electricity and magnetism. The pattern of the book as suggested by its title is a record of the findings of the scholars who developed the science from its beginnings. It is remarkable how well this book covers the various fields of physics without being too elementary and still not being beyond the understanding of individuals who have not studied the subject. Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $6.00 per copy in the U.S.A.

Principles of Food Freezing

John Wiley & Sons, Inc. have just issued "Principles of Food Freezing" by Gortner, Erdman, and Masterman of the School of Nutrition, Cornell University. (281 pp. 5½ x 8½).

The authors have collected in this volume some of the basic principles governing the various steps of selecting and processing foods for freezing, and of storing them in the frozen state.

Although most of this book deals largely with the food freezing operations, it is of interest to the paper industry because of the various packaging and storing problems involved.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $3.75 per copy.

Organic Reagents

Interscience Publishers has just issued "Organic Reagents" by John F. Flagg of the Research Laboratory, General Electric Company (300 pp. 6x9). The objective of this book is to describe the various organic reagents (precipitants) used in gravimetric and volumetric analysis, and to indicate the type of analytical procedure in which they may be used to advantage. This is the fourth in a series of monographs on analytical chemistry and its applications.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $6.00 per copy.